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Discussed in this thesis are the linear (Skinner), intrinsic, adjunctive, mathetics, and idiomorphic approaches to language laboratory programing. The appropriateness of these different programing styles is considered along with the setting up of objectives, evaluation, and relevant linguistic theory. A programed French phonetics course is analyzed in detail, and a literature program is outlined. Two concluding bibliographies group references by chapters and list references on foreign language teaching and testing that deal with programed learning. (AF)

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# SOME APPROACHES TO PROGRAMMING FOR LANGUAGE LABORATORIES WITH PROPOSALS FOR INCREASING THEIR EFFECTIVENESS

## A THESIS

Presented in fulfilment of the
requirements of the degree of
Master of Arts, Monash University,
1966.

Raymond Jean Lamérand

FL 000 829

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Arthur A. Lumsdaine and Robert Glaser have produced a source book which is so frequently cited in the pages which follow that it seemed desirable to use the abbreviation:

TMPL for Teaching Machines and Programmed Learning, Washington.
Department of Audio-Visual Instruction (DAVI) of
the National Education Association (NEA), 1960

For similar reasons, Alfred De Grazia & David A. Sohn's book:

PTAM or Programs, Teachers, and Machines, Bantam, NY, 1964,
has been cited in abridged form.

The writer's original Finding List of Articles on Language Laboratories, distributed by the Australian Federation of Modern Language Teachers' Associations compiled in 1962 is now superceded by a far more complete list in which items still unavailable in Australia are listed with an asterisk (*). The writer incorporated in its pages all books and articles consulted in connection with the writing of this thesis, but because of its bulk, this list is not included in these pages. The revised Finding List of Publications on Language Teaching is available from the Honorary Organizing Secretary of the Australian Federation of Modern Language Teachers' Associations in the Department of Science Languages, University of Melbourne.

## INTRODUCTION

0.1 What facilities are there in a language laboratory?

0.2 Broadcast and library facilities.

0.21 Broadcast audio-passive and audio-active modes.

0.22 Library total or partial self-instruction modes.

0.3 What is programming?

0.4 Where did the idea of programming originate?

0.5 Application to the language laboratory.

0.61 Skinner's format.

0.62 Crowder's format.

0.63 Pressey's format.

0.64 Gilbert's format.

0.65 Pask's format.

0.66 Delimiting the field.

WHAT FACILITIES ARE THERE IN A LANGUAGE LABORATORY?

0.1 The Language Laboratory has been understood as consisting of a tape-recorder or gramophone at the teacher console and student positions containing earphones only (audio-passive mode), earphones and microphones (audio-active mode, provided the wiring feeds the student's voice back through the earphones), or earphones, microphones and individual tape-recorders. [1]

0.2 "Broadcast" lesson tapes are used for the audio-passive and audio-active modes of student activity; "library" lesson tapes can be used for self-instructional purposes in laboratories where students have personal tape-recorders.

0.21 Audio-passive installations force the teacher to roam from student to student to listen to individual performances. Audio-active laboratories are so wired that the tutor can listen to or instruct students personally, in small groups, or the class as a whole simply by manipulating switches on the console. This obviates embarrassing self-conscious students by correcting them while other members of the class listen in. Furthermore, students whose performances are satisfactory need not be held up or distracted by those requiring explanations.

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1. Stack, The Language Laboratory and Modern Language Teaching. NY, 1960, Chapter 4. A second edition has just been published.
Derek Van Abbé, "Audio-lingual methods in Modern Language Teaching", in Brian Dutton (ed); A Guide to Modern Language Teaching Methods, London, 1965, pages 107 ff.

0.22 Throughout the pages which follow, tapes designed for use on the students' individual tape-recorders must be differentiated from those for broadcast from a console only. The "library" system can be used for total self-instruction where the teacher is not present in the laboratory, or alternatively for partial auto-instruction where the role of a monitor is taken into account in designing the lesson tape. The "broadcast" system allows the student no control of the lesson material and is often used when a monitor is present.

## WHAT IS PROGRAMMING?

0.3 Whatever the presentation mode of lessons in a classroom, whether with or without a teacher, with or without electronic teaching aids, with or without something to write with, some techniques can be called "programmed", some not. A lesson plan can outline objectives, the means of communicating ideas and stimulating thought, and the criteria for validly testing achievement of the educational goals envisaged. The lesson is not for that reason called a "programme". A planned lesson of this sort takes on the character of a programme when it caters for active participation on the part of the student, gives knowledge of whether the student is right or wrong in the various steps of the lesson, and provides evidence that the student has performed according to the level of achievement sought by the programmer

Programming as a concept implies a technology of education: an attempt to systematise the learning process according to educational theories espoused by the teachers. There is an analogy possible with preparing a compiler for a computer: the goals of the activity are listed, the orders are formulated for the computer to "learn" and "obey", error routines are devised to ensure that all the information is correctly stored and satisfactorily applied to the materials fed into the machine on subsequent occasions. Programmed instruction attempts to furnish students with an analogous "compiler" to cope with future lessons and future situations

## WHERE DID THE IDEA OF PROGRAMMING ORIGINATE?

0.4 Skinner was instrumental in generating widespread enthusiasm for programmed instruction.[2] He saw the findings of scientific research receiving practical application everywhere except in the field of teaching. He was not the first to try and introduce technological advances into the educational field for Pressey had described a machine which tested and taught in 1926.[3] Pressey advocated adjunctive[3] programmes consisting of materials and tests for student self-instruction Skinner observed that

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[2] "The Science of Learning and the Art of Teaching", Harvard Educational Review, (1954), reprinted in his Cumulative Record, NY, 1959, pages 145ff.

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[3] "A Simple Apparatus which gives Tests and Scores - and Teaches", School and Society, XXIII, (1926), no. 586, reprinted in Lumsdaine and Glaser (eds.), Teaching Machines and Programmed Instruction, Washington, 1960, pages 35ff.

Pressey's pioneering had been largely overlooked by teachers and championed the use of auto-instructional devices employing "linear" programmes. This type of programming was intended to force bright and duller students alike to proceed by small steps, actively and overtly responding to stimuli presented. The behaviour emitted was considered to be reinforced when the student ascertained from the programme whether his answer was right or wrong. Overall mastery of the lesson material was claimed to result from working through to the last item or frame of the programme. Crowder widened the concept by rejecting the need for small steps, for the constant use of overt constructed responses, and for merely giving the student the right answer after each frame instead of attempting to deal with variant responses.[4]

0.5 Those who had for years been preparing recorded materials for the teaching of languages in various laboratories also had occasion to review their procedures in constructing drills. Some designed programmes appropriate to total or partial auto-instruction and total or partial dependence on preliminary verbal teaching on the part of a tutor.

0.61 Before discussing the theories underlying various types of programming, we must take a closer look at different formats adopted. Skinner wanted students to work at their own pace on the grounds that they would be motivated to learn once they felt they were acquiring new knowledge and making progress. The experience of making a correct response to a given stimulus would not only reinforce the student's knowledge but inspire enthusiasm to continue working through the lesson material.[5] Lessons were cut up into small frames of information containing a blank the student had to fill in. Frames were to develop logically one from the other until the essential instruction was complete and an objective test could measure how much "knowledge" the student had acquired Filling in the blanks was called making constructed responses

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[4] *The Concept of Automatic Tutoring*, (1955), abstracted by Fry, Bryan and Rigney, "Teaching Machines, an Annotated Bibliography," *AV Communication Review*, 8, (1960), in part III, pages 18ff.

0,62 Crowder was unwilling to adopt this technique He tested how well students understood what they read and catered for different possible answers to test questions. His approach made for lengthier frames than Skinner's, for responses of the multiple-choice type and for making further reading dependent on the choice made Crowder expected the student to make a decision[6] whenever an important point was reached and "scrambled" the pages of his programme to encourage students to turn to the page appropriate to the answer they chose His

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[5] 5. *ibid.*, page 109.

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[6] 6. Crowder, "Intrinsic Programing: Facts, Fallacies, and Future", in Filep (ed), *Prospectivesin Programing*, NY, 1963, page 87.

"intrinsic" programmes became known for their "branching" sequences of instructional materials.

0.63 Pressey reacted less forcefully to Skinnerian programming than did Crowder. He did not give remedial instruction to those who chose wrong answers on his multiple-choice tests. Rather he asked students to keep trying at the same item until they eventually found the right answer This response was supposed to be impressed on their minds because it alone held the key to progressing to the next item of the programme and be released from having to revise the same item on a subsequent occasion.[7]

0.64 Gilbert accepted Skinner's Behaviorism and considered linear programming techniques inconsistent with this psychological background. His contribution was to develop a system of "Mathetics" He planned exercises which worked back from the objective envisaged to the problem in hand, basing his system on Skinner's principle of "chaining" Reinforcement was derived not from finding out that one's response was correct but from a self-assurance that one could not be wrong because one was "working back" from the answers.

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[7] Pressey, "Development and Appraisal of Devices Providing Immediate Automatic Scoring of Objective Tests and Concomitant Self-Instruction", Journal of Psychology, 29, (1950), as reedited for Lumsdaine and Glaser (eds), Teaching Machines and Programmed Learning, (1960), page 78.

0.65 Pask worked with elaborate teaching machines operated in accordance with Cybernetic theory[8] The "extrinsic" programming developed for use in computer based instruction is not relevant to existing language laboratories.

0.66 In this thesis, the approaches of Skinner, Crowder, Pressey and Gilbert all receive attention in the measure that they throw light on programmes already published and techniques which can profitably be exploited. Without pretending to disparage Skinner and Crowder as professional psychologists, the essay questions the logical consistency of programming techniques they have devised and their desirability for language teaching. Different skills lend themselves to varying approaches and demand by way of preamble some brief outline of areas which it is not for us to discuss in depth:

The specifying of educational objectives for programming,
The techniques of measuring proficiency in performance,
The fundamental linguistic theories which give rise to programming procedures different from those used in other disciplines.

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[8] Wiener, Cybernetics, Cambridge Mass., (1949), 2 ed. (1961), Chapter ix, and his Human Use of Human Beings, Boston (1950), 2 ed. (1954), Chapter xi. Pask, "Adaptive Teaching with Adaptive Machines", in TMPL, pages 349ff., (1960).

# CHAPTER I:

## SPECIFYING EDUCATIONAL OBJECTIVES FOR LANGUAGE LABORATORY PROGRAMMING, EVALUATION OF PERFORMANCE, AND THE RELEVANT LINGUISTIC THEORY

1.1 General Overview of Objectives

1.2 Type of Detail Needed

1.3 Listening Comprehension, Objectives Expressed in terms of Linguistic Theory, and their Evaluation

1.4 Speaking and its Evaluation

1.5 Reading Comprehension

1.6 Translation

1.7 Cultural Awareness

1.8 Creative Writing and its Evaluation

1.9 Literary Appreciation

## General Overview of Objectives

1.1 Because programming does not require student activity for its own sake, it is of paramount importance first to decide what is to be taught. In language study, objectives must be related to age, background, and intended use as envisaged by pupil and teacher[1]. Prescribed syllabi for French differ from state to state and from country to country and Victoria's "understand simple spoken French" and "express himself with reasonable facility in French, both in speech and writing"[2] becomes in Scotland :

> "training pupils to listen and to reproduce the sounds and words with sensible use of the phonetic symbols..."[3]

Whatever the course or method prescribed, objectives include the recognition and use of certain areas of vocabulary, the recognition and use of syntactic structures and sentence patterns, the acquisition of the skills involved in producing standard utterances in speech and writing and of recognizing meaning in speech and printed word[4]. In some language schools, instantaneous spoken and polished written translation loom large in the curriculum[5]. University handbooks seldom state the

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1. Mackey, Language Teaching Analysis, London, (1965), page 162.

2. The Victorian Universities and Schools Examinations Board: Directions and Prescriptions, Melbourne, (1966), pages 116-117.

3. Scottish Education Department: Secondary Education, Edinburgh (1962), para. 418, page 88.

4. Mackey, ibid., pages 264 ff.

5. Point Cook School of Languages. Note the University of Tasmania: Matriculation Manual, Hobart, (1966), page A 21.

objectives of French courses offered but imply in their prescribed texts and their outline of assignments and examinations an emphasis on appreciation of literary texts and frequently of cultural background[6]. Marty's detailed description of the terminal behaviour expected is seldom imitated elsewhere, but it does indicate the type of specifying of objectives required prior to commencing programming[7].

1.2 In order to write a programme, it is not enough simply to decide that we wish to teach a student to recognize and produce authentically the vowel sounds of the language. We must specify in detail how much is to be taught about the vowel system, how fine a discrimination is to be expected between the medial /ɛ/ of médecin and the open /ɛ/ of mettre. We must specify whether we are teaching the philologist's insistence on /ɛ/ in je vais or the empirical phonetician's acceptance of /e/. Examples could be multiplied, but these few serve to stress the essential need of a minute and exhaustive itemization of the fine details to be taught in a programme[8]. Not till the objectives are clear can a valid evaluation be made of a student

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[6] Monash University Faculty of Arts: Handbook, Clayton, (1966), pages 96 and 100.

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[7] Programming a Basic Foreign Language Course, Vermont, (1962), pages 1 - 3.

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[8] Politzer, Teaching French, an Introduction to Applied Linguistics, New York, 2ed. 1965, pages 63 ff.
Mackey, op.cit., pages 264 ff.

performance when working on a programme, and in most cases, the two phases of teaching and evaluation go hand in hand. Mathetics alone separates the two approaches, but its particular contribution to language learning will be reserved for a later chapter.

Besides describing objectives in detail, it is necessary to distinguish facts to be learnt by heart and used when appropriate and skills which characterize language as behaviour[9]. Mackey in his account of language as behaviour is careful to associate himself with linguists like Pike and Zipf rather than with psychologists of the behaviorist school[10]. Facts requiring memorization are retained while used and are often forgotten with the passing of time but language phenomena mastered as behaviour are retained into old age and even into advanced neurosis[11]. The factual content of language learning extends to grammatical usages explained as such and intended to be used in rendering a passage of English prose into a foreign language, the behavioural content extends to comprehension of what is heard or read and the ability to speak and write creatively.

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[9] Politzer, ibid., page 2. See too the discussion of this in Rivers, The Psychologist and the Foreign Language Teacher, Chicago, (1964), pages 80 ff.

[10] op.cit., page 20 On page 122, he is careful to point out that skill in speaking may exist without other language skills like translating. Behavioural skills are therefore rightly conceived as a plurality.

[11] West, "Learning English as Behaviour", English Language Teaching, XIV, (1960), page 6.
West and Lee, Editorial Correspondence Section, English Language Teaching, XIV, (1960), page 75.

1.3 In their discussion of educational objectives Bloom and his collaborators made a distinction between knowledge and comprehension[12]. When language teachers speak of listening comprehension, there is a tendency to overlook this necessary distinction in objectives: recognition knowledge of sounds (phonemes), morphemes (meaningful elements) and vocabulary[13], and the unconscious behavioural recognition of significant elements and the pattern in which they occur[14]. Language behaviour is "reinforced through the mediation of other persons[15], and must eventually come to embrace the reactions of an organism as a whole to a social enviroment: words, postures, facial expressions, gestures, pauses, intonation and exclamatory noises[16]. In most cases, appropriate responses to this multiplicity of stimuli can be taught satisfactorily only where a visual element is provided for - whether this be the teacher in class, the illustration on the printed page, or the changing images on the screen or television tube. There is much to be learnt by heart[17], but for the purposes of inventory it is probably less artificial to list together the interdependent factors we differentiate as knowledge and skills.

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[12] Taxonomy of Educational Objectives, I: The Cognitive Domain. NY, (1956), page 15.

[13] Hockett, A Course in Modern Linguistics, NY, 1958, pages 15, 123, 266 etc.

[14] Mackey, op.cit., pages 261 ff.

[15] Skinner, Verbal Behavior, NY, (1957), page 14. Reinforcement will be discussed at length in Chapter 2.

[16] West, op.cit., page 3.

Identifying the sounds of the foreign language as they occur in everyday speech involves noticing the difference between the phonemes of the learner's mother tongue and those of the target language; obvious differences may well be the easiest to recognize, new yet seemingly familiar sounds among the hardest. Juxtapositions of phonemes in the native and target languages need to be compared and contrasted and unfamiliar combinations which may need special attention in a teaching programme. Allophones used by native speakers in certain of these combinations also need to be tabulated, as these may sometimes be difficult to recognize and will eventually need to be taught to those aspiring to speaking faultlessly in the foreign tongue[18]. For a language like French, students must also recognize intonational and stress patterns, the grouping of words which is so bewildering to English speakers, the phenomena of the neutral "e", optional and mandatory liaisons, and the elisions needed and forbidden. A further prerequisite to listening comprehension is recognition of the vocabulary and grammatical patterns in the materials to be presented[19]. The role of learning the kernel sentences and

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17. Bloom, ibid., pages 29 and 35

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18. Marty, op.cit., page 2

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19. Chomsky, Syntactic Structures, The Hague, (1957), pages 15, 21 ff

suitable transformations through prompted and confirmatory drill procedures appear to gain a measure of experimental justification from the work of Scherer and Wertheimer[20]. Stolurow established the role of overlearning of vocabulary to ensure long term retention[21]. Drills help the listener to recognize a pattern previously introduced in various derived sentences heard in conversation or narrative. They also ensure an ability to discern transformations signifying changes of tense, mood and voice, the variations entailed in changing questions to answers or in linking sentences[22]. Of the same order is recognition of variations in sound arising out of juxtaposing words which are pronounced differently in isolation[23].

Listening comprehension is a skill which can be specified as a complex of abilities involving recognition of vocabulary, patterns, stress and intonation in the stream of sound that is the foreign language. Performance can be tested

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20. A Psycholinguistic Experiment in Foreign-Language Teaching NY, (1964), pages 110 explains the deficiencies of auditory comprehension tests used.

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21. A Comparative Study of Methods of Programing Materials for Efficient Learning in Self-Instructional Devices, Urbana, (1961), 14 pp mimeo. His later reports from the Training Research Laboratory at the University of Illinois further established a relationship with the Binet Mental Age.

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22. Chomsky, op cit., pages 61 ff.

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23 Belasco, "Structural Drill and the Refinement Principle", in Gravit and Valdman (eds): Structural Drill and the Language Laboratory, Bloomington, (1963), page 5 gives a short discussion of these "sandhi-variations".

independently of other skills in the target language; evaluation of the student's achievement in realising comprehension objectives when he hears conversation or narrative is invalidated when tests depend on other foreign language skills as well[24]. If the test is solely conducted in the target language, a multiple-choice option involving recognition only measures comprehension better than a quiz requiring the student to recall appropriate responses in the target language also. When foreign words appear in print in listening comprehension tests, care must be taken that the student is not in fact being tested on reading comprehension and that the print is in no sense a hazard to the examinee. Multiple-choice options presented on tape for listening in normal circumstances constitute a more satisfactory test of comprehension than the use of print. Should the options be given in the vernacular, care must be exercised that ability to translate be not examined when comprehension only is expected. Hence, in specifying objectives for the teaching of auditory comprehension, the programmer needs to be conscious of the factors involved in recognizing the meanings of utterances and the evaluation of performances. Specifications of objectives and tests of performance at various levels of proficiency are well expressed in terms of the number of syllables per minute with the proviso that a slow delivery be not understood to involve distortion of phonemes such as is evident in some recorded materials[25]. However, the determining and testing of objectives in language teaching is a study in itself and only a meagre outline is given here to prepare for discussion of programming techniques

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[24] Scherer, op.cit., page 108

[25] Marty, op.cit., page 3; note the distortions in record 2 of the Linguaphone series of French records.

1.4 It is Julian Harris' contention that listening comprehension should be developed in conjunction with speaking skills[26]. The interdependence of these separate skills must be established to develop fluency of rejoinder to a spoken utterance. Speech production itself involves control of the sounds of the foreign language, the intonation, grouping, and peculiarities introduced by juxtaposition of syllables, but fluency will be gauged by the lapse of time between the student's hearing an every-day stimulus and his formulating a commonplace response. For normal situations like class, shopping, introductions, and social small talk, the teacher must expect the student's reaction time to become less than three seconds. In such circumstances, ensuring that the student makes an appropriate reply sometimes tests listening comprehension also, but in many cases, it is as much a test of rote memory as anything else.

Pronunciation must at least be intelligible and preferably acceptable as standard for the country concerned. While the vocabulary used by students involves recall rather than anything else, its appropriateness in a given context may well involve skills of a higher order[27]. Since we shall have occasion to return to the matter in the concluding chapters we shall limit ourselves to recording how responses can reflect powers of analysis, synthesis, and evaluation. Hence objectives and tests related to speaking a foreign language must indicate levels of communication to be achieved and what aspects of performance are to be measured. In a grammar-translation methodology, the skill of applying theoretical rules to concrete situations will need to be evaluated since most of the class time is devoted to it[28]. Further, exercises aimed at developing listening comprehension can also serve the second purpose of developing in a speaker ease of manipulation of the constituents of sentences[29]. This entails giving attention to the speed and aptness of rejoinders to stimulus sentences, and at a creative level, the ability to convey emotions, describe a picture or situation, use the tense and case system of the language and still communicate ideas in apposite grammatical patterns. Oral examinations can test these skills and the higher order skills associated with intelligent literary appreciation, philosophical reflection and evaluation of art forms[30]. In the collateral

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[26]. Teacher's Manual for Basic Conversational French, NY, 3ed. (1963), page 1

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[27] Bloom, op.cit., page 125

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[28] Mackey, op.cit., page 153

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[29] For fuller discussion of the pedagogy see Chapter IV Nida, Morphology, the Descriptive Analysis of Words, Ann Arbor, (1949), pages 204-5 and Hockett, op.cit., pages 147-156 develop the concept

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[30] Lado, Language Testing: the Construction and Use of Foreign Language Tests, Longmans, London, (1961), page 241.

tasks of teaching and testing the proficiency of speaking skills, Belasco insists that the programmer map out for his own benefit the various permutations and combinations of speech patterns being taught to ensure that nothing likely to cause difficulty has been omitted[31]. Later, for more advanced speech production, it will be necessary to identify and discriminate between the phonetic quality of sounds in the mother tongue and that of vowels and consonants in varying combinations in the target language. If the programmer does not work through a systematic chart, he may overlook precluding unacceptable pronunciations and defective performances on the part of the student may chance to reveal shortcomings in the programme.

1.5 Recognition of written forms of the language also involves a knowledge of spelling conventions and training in visual identification of structural transformations[32]. Reading comprehension is no less complex a skill than listening or speaking and needs to be taught systematically. It has the advantage that it can be readily measured with the use of pencil and paper alone. Testing can be effected on a gradation of levels: where the emphasis is on securing information from the printed page, objective tests can check knowledge of content and recognition of word meanings. Where understanding implications, evaluating the opinion expressed or its relevance to

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31. op.cit., page 29.

32. Lado, op.cit., page 223.

everyday life is concerned, more searching tests can be devised[33].

1.6 Of special significance in foreign language study is the complex of skills involved in translation: the ability to express ideas in a different formulation or a different language[34]. The level of difficulty is determined by the vocabulary count and the syntactic patterns involved. At its easiest, the student must transfer conversation or prose into an appropriate equivalent; at its hardest, an appreciation of stylistics (involving evaluation) is also involved[35], and at this level translation should be reserved for specially trained advanced students[36].

1.7 A further element in complete comprehension of a foreign language utterance or publication is ability to identify the measure to which these reflect a variant culture and outlook on life[37]. A comparison of vocabulary equivalents can bring to light the students' ability to discriminate between such related words as "présenter", "offrir", and "remettre" as equivalents to "give" in a particular situation, or his ability to generalize from "aerial" to "antenne" or from any particular device for which the French equivalent is "appareil"[38]. A classic difficulty for an Australian student is to attempt to speak of his "home" in French. Examples of misconceptions encountered could be multiplied[39]. Positive instruction or experience in anecdote and lecture can effectively forestall misunderstanding and provide a depth of insight into a foreign culture which deserves to be listed among the conscious goals of language teaching and needs to be measured in tests[40].

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[33] 33. Bloom, op.cit., pp 89 ff

[34] 34. Nida, Toward a Science of Translating, Leiden, (1964), pages 146-147

[35] 35. Bloom, ibid., page 185

[36] 36. Mackey, op.cit., page 289.

[37] 37. Brooks, "Learning a Modern Foreign Language for Communication", Northeast Conference on the Teaching of Foreign Languages, (1961), page 18.

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[38] Carroll, Language and Thought, Englewood Cliffs, (1964), page 28

[39] Freeman and others: "Study Abroad", in Bishop (ed): Foreign Language Teaching: Challenges to the Profession. Northeast Conference on the Teaching of Foreign Languages, (1965), page 52.
Bishop, editorial in Culture in Language Learning, Northeast Conference on the Teaching of Foreign Languages, (1960), page 12.
Lado, op.cit., page 276.

[40] Friedl, "An Anthropological Concept of Culture" in Bishop (ed): Culture in Language Learning Northeast Conference on the Teaching of Foreign Languages, (1960), page 25.

1,8 A close scrutiny must be made of the complex skill of writing to determine what precise objectives must be strived after in improving it. The written language has so long been the object of study that there has been a neglect of examining what it entails. Developing skill in writing the foreign language involves an ability to spell accurately. It demands a knowledge of the graphic representation of syntactic structures such as signs of person, number, gender, tense, mood, and voice in a way that is not required at the audio-lingual introduction[41]. As part of the writing skill, these conventions can be inculcated first for recognition, then for use[42]. The knowledge can be acquired gradually, but becomes part of a skill only when the student gains a measure of fluency in self-expression without continual conscious application of rules and paradigms. At all levels of proficiency, testing of performance can ensure that fundamentals are grasped. "Spot" dictation differs from the conventional in that precise knowledge of detail can be tested without encouraging students to make unnecessary errors of transcription. The student's test blank contains only a few spaces in an otherwise complete dictation passage, and on the basis of hearing the passage read aloud, he is expected to insert missing words, agreements, and punctuation[43]. More sophisticated work is required of the student who summarizes a passage read in his own words, paraphrases a poem or play in everyday language or writes an essay expressing his thoughts on particular situations or incidents[44]. More searching still is the written analysis or synthesis of a philosophical work, or a critical appreciation of a work of art[45]. It is at this level of appreciation of stylistics that we might add the formal exercise of polished translation into the target language[46].

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[41] 41. Lado, op.cit., pages 248, 252.

[42] 42. ibid., page 249.

[43] 43. ibid., pages 250, 251, 256,

1.9 When the teacher's goal is primarily to communicate enthusiasm for French literary texts being studied and to inculcate standards of criticism, many of the skills outlined above are prerequisite to satisfactory work. It is controversial whether objectives can be adequately stated in behavioural terms and even more so whether much can be achieved by programming techniques in this field. Further discussion is therefore postponed to Chapter 3[47].

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[44] ibid., page 257.

[45] ibid., page 259.

[46] Nida, op.cit., page 152.

[47] Lamérand, "The Language Laboratory and the Study of Literature", Babel, New Series, Vol 2, (1966), pages 22-25.

## CHAPTER II: SKINNER'S LINEAR PROGRAMMING

### 2.1 Habit-formation based on "operant" conditioning

Law of Effect to "strengthen" behaviour

Reinforcement - positive not negative
primary in experiments, secondary in teaching

Generalization of stimuli

### 2.2 Teaching skills as habit-formation demands

i) immediate reinforcement
ii) not according to fixed ratio
iii) but rather a variable ratio
iv) differentiation by positively reinforcing what was satisfactory, negatively what was not
v) danger of presence of negative reinforcement - possibility of extinction
vi) discriminative stimulus and discriminative reinforcement
vii) application to language laboratory learning
viii) testing that objectives of programme have been realized

### 2.3 Skinner's objectives and programming

Application to Verbal Behaviour

2.1 Skinner's *Science and Human Behavior* refers to the movement of an organism as a response to a prior stimulus[1]. This movement can be a physiological reflex action; it can, through a process of stimulus substitution, be a conditioned response elicited by reinforcing the associations between the response and a previously neutral stimulus[2]; it can be the response to a supposed but unobserved stimulus where the emitted response is reinforced[3]. Because the stimulus in the latter case is not under the control of the experimenter as it was in the two previous cases, the response or operant is a contingent event and the most that can be done to produce it is to create conditions where the probability of its being emitted is increased.

This "operant" conditioning depends on two principles: the *Law of Effect* first formulated by Thorndike and the use of a programme[4] which "shapes" the changes of behaviour. The *Law of Effect* according to Thorndike provides that when an act is followed by a satisfactory state of affairs, the probability of its recurrence in a similar situation is increased[5]. This enunciation Skinner was at pains to refine. As he explained, Thorndike's Law is no theory but "a rule for strengthening behavior"[6]. According to Skinner, an organism behaves in a particular way "because of the consequences which have followed similar behavior in the past"[7], or as Hilgard formulates it: "a stimulus-response sequence could be strengthened by a reward that followed it"[5]. Such formulations by their lack of dogmatism avoid the pitfalls of "post hoc ergo propter hoc" conclusions in scientific work. If a schedule of reinforcements is devised to make it more probable that a given operant[8] be emitted, a type of "superstition" results in the subject. A pigeon can be regularly reinforced whenever its movement approximates in any way to the operant the experimenter wishes to have it emit. Originally random stretching of the neck, stamping of the foot and turning around can be organized into a type of ritual dance which the pigeon performs when deprived of food[9]. The superstitious behaviour induced is a clear example of operant conditioning.

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[1] NY, (1953), pages 45ff.

[2] Pavlov as explained in Skinner, *op.cit.*, page 53

[3] Skinner, *ibid.*, page 65.

[4] The term "programme" as used by Skinner in this context refers to differentiation of response and not merely to discrimination of stimuli upon which much of his experimentation was carried out.

[5] Hilgard; *Introduction to Psychology*, NY, (1953, 2nd 1957), page 244b. See Rivers: *The Psychologist and the Foreign Language Teacher*, Chicago, (1964), page 165.

Skinner considered it desirable to apply to the human classroom the principles he used when training rats and pigeons[10]. He deprecated the aversive stimulation in otherwise progressive schools which abolished corporal punishment at the turn of the century and replaced it with the teacher's displeasure, criticism from the peer group, competitive marks in frequent tests and "talks" from headmasters. He wondered whether the long time lag before the students got any reinforcement for their classroom performances could not be reduced to a minimum with a little ingenuity, thereby greatly increasing the efficacy of the experience. He considered that the teacher in fact created many psychological problems for his students if he did not devise a means of reinforcing their efforts step by step, at least to the extent of giving them knowledge of the success or failure of their efforts as they went along. He advocated a programme which let the students know immediately whether they were right or wrong. He suggested that where "the natural reinforcement inherent in the subject-matter is not enough" extrinsic rewards like the teacher's commendation, the social prestige of successfully completing the assignment, the opportunity to select a more captivating occupation should be employed to reinforce correct responses[11].

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[6] Skinner, op.cit., page 81.

[7] ibid., page 87.

[8] This in Skinner's thought can take in a series of operants which the subject comes to emit as a single unit. See his Verbal Behavior, NY, (1957) page 20.

[9] Skinner: "'Superstition' in the Pigeon", Journal of Experimental Psychology, 38, (1948), reprinted in his Cumulative Record, NY, (1959), page 404. See too his "Science of Learning and the Art of Teaching", Harvard Educational Review, 24, (1954), also reprinted in Cumulative Record, page 147.

[10] Second reference in note 9, page 149.

In Skinner's theory, experimentation carried out on reinforcing the behaviour of rats and pigeons played a large part[12]. A pigeon trained in a specially designed box to dance for its food desisted if its "superstitious" behaviour consistently proved ineffectual. Frustration led it to flap its wings or coo and Skinner saw a parallel in a child unable to open a drawer giving vent to his irritation with violence and swearing[13]. Skinner concluded that lack of any reinforcement led to the extinction of the conditioned responses of an organism. Further experiment showed that intermittent reinforcement produced behaviour which persisted longer than it did in the situation where all responses were rewarded. Again, a reinforcer became generalized when it was present simultaneously with a succession of primary reinforcers. For example a bell ringing when a pigeon executed a particular dance ritual and was rewarded with a food pellet could also be made to ring when the bird pecked at a lever Both the dance ritual and the lever pecking could subsequently be reinforced by the sound of the bell. A child is often encouraged to cry by being reinforced with food, an effect few parents intend. The parent who provides a generalized reinforcer like marks of affection in a wide variety of situations seldom suffers unduly in consequence. But, according to Skinner, when an irritated parent gives primary reinforcement only to the crying, the child comes to emit behaviour which heightens the parent's irritation still further[14]. Whether Skinner's extension of his theories on the acquisition of behaviour patterns to the human order are based on experiment or not, the practical applications they have inspired, which appear to have met with success, have won them considerable attention. But theory and practice are hard to reconcile when it comes to improving skills already acquired; at this stage, inconsistencies can only be resolved by careful experiment.

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[11]. ibid., pages 153-154

[12]. Skinner: "Operant Behavior", American Psychologist, 18, (1963), pages 509, 512.

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[13] Science and Human Behavior, NY, (1953), pages 69-70.

[14] ibid., pages 77-81. Skinner tends to base his ratiocinations on experiences with his own first baby. That he interprets the child's behaviour in the light of his experimentation with other animals does not scientifically validate his conclusions, however reasonable they may appear.

A skill once acquired in an elementary way needs to be modified to perfect it Nearly always a skill like knitting or building radio valves comes to take on the character of a single operant comprised of a complex of responses emitted in a given order. To refine a skill, certain desirable elements in its exercise need immediate reinforcement. A marksman, according to Skinner, finds that "extremely small-scale properties of response are differentially reinforced by a hit or a miss".[15] The proficient marksman comes to recognize the sensations associated with his scoring a "bull", and this "feel" is a type of feed-back which in him is closely associated with the performance of the skill itself[16]. Where reinforcement occurs only at intervals, say every ten shots, the rate of improvement tends to be slowed down[17] and in fact tends to become extremely slow immediately after each reinforcement[18]. Skinner's problem was to find out how to keep up the rate of improvement without making it conditional on learning the result of each successive shot.

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15. ibid., page 96.

16. In this connection, compare Gilbert's view of the same situation in Chapter 5 where he speaks of "simultaneous" reinforcement.

17. ibid., page 100.

18. ibid., page 126.

Slow improvement was not evident where a variable ratio of responses determined the finding out of results. Instead, except where extinction occurred, the rate of response and the rate of improvement tended to be high[19]. The human examples Skinner chose to illustrate his conclusions appear to be gratuitous extrapolations of what he considered happened in his experimental box. If the analogy between pigeons and men is valid, however, the implications of variable ratio reinforcement for linear programming are considerable.

Differentiation of response and hence actual improvement of a skill can often involve positive reinforcement for some aspect of the emitted behaviour and negative reinforcement for another[20]. Activity reducing negative reinforcement is considered by Skinner to be strengthened by operant conditioning[21]. The persistent threat of various forms of negative reinforcement in the classroom is deemed a hindrance to learning[22]. Its replacement by a scheme emphasising positive reinforcement according to this argument leads to a more favourable climate for the imparting of knowledge[23]. Occasional use of a measure of aversive control to discourage students' remaining content with mediocre performance of skills learnt can, in this context, be seen as leading to a refinement of behavioural patterns. It may happen that while one aspect of a response is rewarded by the positive reinforcement of personal satisfaction over one's performance, another aspect can be inhibited by negative criticism which by dint of repetition eventually brings about the extinction of the unsatisfactory quality[24]. A teacher using a portable microphone in a lecture theatre may be positively reinforced by appreciating that the students have grasped the point he was making, but learn from the occasional signs of distress in his audience that moving too close to the loudspeakers causes unpleasant distortion of his voice - negative reinforcement which will keep him from getting too close to them on future occasions. The negative reinforcement in this case accompanies not the stimulus as happens when a dentist turns on a noisy drill,but the operant because the teacher found his efforts marred through one aspect of his performance. An enterprising tutor who uses programming techniques to teach a particular point to his class may find the results so rewarding as to prompt further work along similar lines, but some defects in his presentation may lead to his having to correct similar errors time and again in assignments and these may prompt him to improve his programming skill[25]. The foreign language student in the laboratory who enjoys the pleasant sensation of comprehending what he hears over his earphones may be led to be more discriminating when he is told how to show in his response that he has grasped the significance of this or that structure.

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[19] ibid., page 103. Unfortunate by-products were the severe strain and exhaustion sometimes resulting from the speed with which the operants were emitted.

[20] ibid., page 173

[21] ibid., page 176.

[22] ibid., page 406.

[23] Second reference in note 9, page 154.

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[24] reference in note 8, page 166.

[25] reference in note 13, pages 403-405

Provided that his experiences in the language laboratory in general positively reinforce the efforts he has expended in coming to grips with the material, the negative criticism can lead to salutary improvement. Lack of tangible assurance of progress in the form of ease of performance of difficult exercises or commendation from a trusted monitor can produce overall discouragement over the futility of spending many hours on now seemingly pointless exercises.

The processes of generalization and discrimination of stimuli are reciprocal[26]. The student in the language laboratory has to come in contact with both processes. The Chinese student learning English must recognize that the three "ay" sounds he hears in "Today's payday" are phonemically the same. The allophones of "ay" on different tonal levels come to be recognized as variations of a single phoneme: "Make way, lady! - Hey! lay off, Mate!" By the process of generalization, the "ay" sounds uttered by the salesgirl, the chauffeur and the navvy are recognized as the same phoneme. The initial tendency of the Chinese to differenciate between similar if not identical sounds of various pitches needs to be reinforced in distinguishing between "payday" and "pie-day", "Mike" and "make", "Lady" and "laddie". Stimulus discrimination of this nature requires the giving of some form of reinforcement when "Lady" is understood as being different from "laddie" in meaning. Where mere knowledge that the message has been understood aright does not suffice, the receipt of added extrinsic reinforcement helps to drive home the lesson. Skinner seems, however, to think that humans are so intellectual that they need no reinforcement other than knowledge that their responses are right[27].

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[26] Holland and Skinner: The Analysis of Behavior, NY, (1961), page 152, frame 22-35.

From the writer's experience in 1952, a particular application of the process of discrimination occurs when a teacher wants a Spaniard to recognize the difference between "pour" and "pur", "sous" and "sur", "roue" and "rue". On the contrary, the Spaniard must employ generalization of stimuli to teach a foreigner to recognize "haber" in its variant allophones /aver/ and /aber/. Where translation is to be taught, discriminations to be made are numerous: "êgeneto ânthrōpos, âpestalmenos para theou," cannot just be transliterated as "happened man, sent from God" for English requires some additions to be made *: "*there happened *a man, sent from God" Alterations of word-order and STRUCTURE lead variously to: "*There CAME *a man, sent from God" (Authorized Version) "*There WAS *a man, sent from God" (Revised Standard Version) "*A man APPEARED, sent from God" (Knox)[28] and criteria must be evolved to discriminate between seemingly acceptable translations. As Nida points out, lexico-grammatical features of both languages need contrasting as do the various contextual factors involved[29].

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[27] 27. Second reference in note 9, page 154.

[28] 28. Nida: Toward a Science of Translating, Leiden, (1964), pages 185ff.

[29] 29. *ibid.*, pages 243ff.

The presentation of a discriminative stimulus can give rise to an operant for which the reinforcement is in turn the discriminative stimulus for yet another operant, so setting up a "chain"[30]. This concept of chaining can be illustrated by our everyday experiences of polite conversation:

"How are you?" - "Fine, thank you. How are you?"...[31]

The chain is lengthened in some cases by an observation on the weather:

"Isn't it cold/hot/windy?"

To which observation English speakers usually agree and Europeans disagree. Hilgard systematizes the operant conditioning of a rat in a Skinner-box in the following chain:

| Discriminative stimulus | Response of Rat | Reinforcement |
|---|---|---|
| Bar location | Approach of rat to front of box | Sees bar |
| Visual bar | Rising on hind legs, puts paws on bar | Feels bar |
| Tactual bar | Presses bar, activating food magazine | Hears noise |
| Apparatus noise | Lowers foreparts to food-tray | Sees pellet |
| Visual pellet | Seizes pellet in teeth and paws | Feels pellet |
| Pellet in mouth... | | [32] |

Panel 1

When the rat is conditioned, this behaviour outwardly takes on the character of a single operant. Independence of the units of the chain can be tested experimentally by extinguishing any given part of it. Keller and Schoenfeld report Arnold's experiments to determine what parts of the pattern were extinguishable without harming the ritual as a whole.[33] In his programming,

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[30] Skinner, reference in note 13, pages 125, 224.
[31] Skinner, reference in note 8, page 72.
[32] *Theories of Learning*, NY, (1948, 2ed. 1958) page 104.
[33] *Principles of Psychology*, NY, (1950) page 203.

Skinner fails to use the concept of chaining to which he alludes in his writings.

2.2 If Skinner is right in applying the theory of operant conditioning to teaching behavioral skills to humans, then the most important feature of a programme must be the provision of immediate reinforcement[34]. He teaches his psychology students:

> "Performing animals are sometimes trained with 'rewards'.
> The behavior of a hungry animal can be 'rewarded' with______
> food
>
> "A technical term for 'reward' is reinforcement. To
> 'reward' an organism with food is to______it with food.
> reinforce"[35]

The task before the student is to construct a suitable answer for the blank in each sentence of the programme. The immediate reinforcement is intended to come from comparing the answer worked out with the key. Positive reinforcement is forthcoming if the student gets satisfaction from knowing that he answered the test question correctly. Such satisfaction is most frequently forthcoming if the student sees some challenge in the test and wants to succeed. As Skinner also points out, it is essential that the response chosen be of some significance in the development of the programme and not distract from its unity[36].

It does not occur to Skinner that when programmes have been revised until even dullards can answer nearly all frames correctly, he creates a situation where many students find that they do not need to seek confirmation from the answer key. Tying a student to a check at every fifth or tenth response seems detrimental to learning according to the results of Skinner's experimental work on fixed ratios[37].

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[34] 2nd reference in note 9, page 146.

[35] reference in note 26, pages 42-44, frames 7-1, 7-2

[36] "Teaching Machines", Science, 128, (1958), reprinted in his Cumulative Record, NY, 1959, pages 163-166

Given that Skinner's experiments on variable ratios of reinforcement are valid evidence that operants intermittently reinforced resist extinction indefinitely[38], the implications appear to be that the frequent but unpredictable reinforcements given by a teacher or monitor may be far more effective in sustaining efforts to learn than any programme which confirms every correct response.

Skinner is not satisfied that students should merely select responses which they recognize as being accurate answers to test questions, but insists that they should construct responses of their own[39]. The procedure may be justified when recall is involved and is certainly of use when foreign language learners have to be taught to produce sounds which are not to be found in their native language. Recognition of sound contrasts between their own language and the target language usually precedes the presentation of contrasting minimal pairs in the target language for discrimination, but on both tasks foreign language students have later to be trained to produce the discriminations themselves in their own pronunciation[40]. Discriminating between English "tip" and French "type", English "tell" and French "tel", French "lui" and French "Louis", French "juin" and French "joint" appear to the teacher easier tasks than they are to the student. Even with the help of preliminary instruction, printed texts and language laboratory tapes, the student depends heavily on differential reinforcement. The single syllable "lui" sometimes needs analysis and dissection before it can be mastered by the student; he needs to know perhaps that part of his pronunciation of the syllable is right and must be retained, that the position of the lips for another part is wrong and must be modified. If a programme cannot be constructed to give such reinforcement, then its administration must be supervised by a monitor who can

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[37] "Reinforcement today", in The American Psychologist, 13, (1958), reprinted Cumulative Record, page 135.

[38] "The Experimental Analysis of Behavior", American Scientist, 45, (1957), reprinted in Skinner's Cumulative Record, page 1

[39] Reference in note 36, page 161.

Both student and monitor are aware of the atmosphere created by the fear of negative reinforcement such as poor marks for an assignment or test. A student very soon gives up trying to learn if he fears that his performance is not good enough, that his marks are consistently too low, that members of staff will form a poor opinion of his efforts. The possibility of extinction is very real. Skinner suggests that the facts, laws, principles and cases to be taught should be classified in logical order and recorded so that no element of consequence is neglected completely after its first introduction in a learning sequence and an appropriate schedule of exercise ensures that the knowledge is not extinguished[41].

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[40]. Politzer: Teaching French: An Introduction to Applied Linguistics, NY, (1960, 2 ed, 1965), page 67.

[41]. Reference in note 36, page 170

Furthermore, Skinner's remedy for frames in a programme which cause students to make mistakes is rewrite them in a multiplicity of smaller steps[42]. Smith and Moore with 95 fifth grade pupils attempted to assess the effect of step-size on the amount of spelling learnt over four weeks[43]. They found that without the teacher's intervention step-size had no significant effect on performance on a post-test consisting of 50 words chosen at random from 164 taught. When teaching graduates mathematics, Evans, Glaser and Homme obtained a contrary result[44] apparently substantiated by Coulson and Silberman working with 80 college Psychology students[45]. Weiss, Maccoby and Sheffield on a fairly short programme[46] and Margolius and Sheffield on a long one[47] came to the conclusion that the optimum performances on post-tests resulted from students' beginning with small steps and gradually increasing step-size The last two experiments quoted were performed with college undergraduates and step-size was understood not so much as increased difficulty (rather the reverse may have been true) but as length of film demonstration before overt responses were made. Given the ambiguous nature of this experimental evidence, we must return to the unproven plausibility of Skinner's observations. Amsel's report of an interview with Skinner[48] and Lumsdaine's review of the evidence on step-size and its changing meaning[49] return to the central question of the desirability of minimizing the likelihood of error through prompts.

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[42] Second reference in note 9, page 153.

[43] "Size of Step and Cueing", *Psychological Reports*, 10, (1962), reprinted in their *Programmed Learning*, Princeton, NJ, (1962), page 205.

[44] "A Preliminary Investigation of Variation in the Properties of Verbal Learning Sequences of the 'Teaching Machine' Type", in Lumsdaine and Glaser (eds), *Teaching Machines and Programmed ~~Instruction~~ Learning*, Washington, (1960), page 448.

[45] Coulson and Silberman: "Effects of Three Variables in a Teaching Machine", *Journal of Educational Psychology*, 51, (1960), pages 135ff, also summarily reported in their: "Automated Teaching and Individual Differences", *AV Communication Review*, 9, (1961), reprinted in Smith and Moore: *Programmed Learning*, Princeton, NJ, (1962), page 209.

[46] "Combining Practice with Demonstration in Teaching Complex Sequences: Serial Learning of a Geometric-Construction Task" in Lumsdaine (ed): *Student Response in Programed Instruction*, Washington, (1961), pages 55-76.

[47] "Optimum Methods of Combining Practice with Filmed Demonstration in Teaching Complex Response Sequences: Serial Learning of a Mechanical Assembly Task", in Lumsdaine, *op.cit.*, pages 33-54

Certain it is that cues and prompts help the student to make the discriminations necessary to refine skills acquired in a rudimentary way; for this experimental evidence abounds[50]. Controlled experiments involving language learning are rare but Lane's experiments on "Acquisition and Transfer in Auditory Discrimination"[51] deserve attention. The audio-lingual programme he used to teach discriminations among the vowels and consonants of Spanish was subdivided into fourteen frames, each of which included allophones of a particular Spanish phoneme and those of other English and Spanish phonemes. Sequence was determined according to the estimated difficulty for English speaking learners of the various items, the programme presenting progressively harder material. Students tended to be over-discriminative and rejected allophones of the Spanish phoneme being taught until "concept attainment" came quite abruptly. In this experiment the counter which reinforced correct responses by adding them to the learner's score negatively reinforced incorrect ones by subtracting units; the counter itself was operated electronically by a signal on the second track of the tape-recorder used. After reflecting on his experiments, Lane warns programmers against the dangers of under-discrimination resulting from attempts to modify sounds in the student's initial repertoire[52], this by way of criticism of a recommendation made in the report of a working committee of which he was a member[53] where English-speaking students of German are advised to begin with English "fish-dish" and gradually modify /ɪʃ/ by repeating the sound with spread lips and eventually also with teeth a little further apart. To his mind this technique evokes the very phoneme (English /ɪʃ/) which the programmer wishes to distinguish from the German one. Pimsleur, Mace, and Keislar conducted a series of experiments to see the extent to which preliminary stimulus discrimination training affected response differentiation in English-speaking students of French[54]. As hypothesized, training in recognizing the different English and French phonemes (French nasal vowels and their English near equivalents) made the students more critical of their language laboratory performance. What Pimsleur suggested in conclusion was that written and visual cues and prompts greatly assisted discrimination training and eventually differentiation in the pronunciation of the French nasal vowels in question[55]. Lane noted that discrimination training needed to be coupled with delayed auditory feedback to the student pronouncing sounds in order for it to be effective[56].

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[48] "Error Responses and Reinforcement Schedules in Self-Instructional Devices" in Lumsdaine and Glaser (eds), Teaching Machines and Programmed Instruction, Washington, (1960), pages 507ff.

[49] "Some Issues Concerning Devices and Programs for Automated Learning", ibid., page 534.

[50] Theoretical issues raised in the reference in note 49 were put to the test with high-school students and volunteers between the ages of 16 and 35. Angell and Lumsdaine "Prompted Plus Unprompted Trials versus Prompted Trials Alone in Paired-Associate Learning", Pittsburgh, (1960), abstracted in Lumsdai and Glaser (eds) op.cit., page 582. This takes up the work of Cook and Kendler: "A Theoretical Model to Explain Some Paired-Associate Learning Data", in Finch and Cameron (eds): Symposium on Air Force Human Engineering, Personnel and Training Research, Washington, (1958), and it in turn was updated by Angell and Lumsdaine: Retention of Material Presente by Autoinstructional Programs which Vanish and Which Do Not Vanish Verbal Cues, Palo Alto, (1962). Carroll's "Primer of Programmed Instruction in Foreign Language Teaching", International Review of Applied Linguistics in Language Teaching, I, (1963), page 124 presupposes this as also does Lane's "Programmed Learning of a Second Language", ibid., II, (1964), pages 254ff.

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[51] American Journal of Psychology, 77, (1964), pages 245ff.

[52] "Programmed Learning of a Second Language", International Review of Applied Linguistics in Language Teaching, II, (1964), page 272.

[53] Hayes et al: "A New Look at Learning", in Bottiglia (ed): Current Issues in Language Teaching, (Northeast Conference Reports) Cambridge, Massachusetts, (1962) page 33.

In applying Skinnerian teaching to language laboratory learning, it appears imperative to analyse the reinforcement given. Students of a foreign language, it is clear, cannot be presumed to have standards of discrimination which they have not been taught . The student cannot be allowed to drill mistakes; otherwise these will be learnt as surely as the lessons being applied in the language laboratory exercises Pimsleur claims that the effectiveness of discrimination training in the language laboratory can be ascribed to the making of an overt response by the student being immediately followed by the information that their response was right or wrong[55]. Is knowledge of results enough? It would seem that a monitor could serve a dual purpose of providing extrinsic reinforcement when useful and of giving remedial instruction when student performances were seen to be defective. As Valdman points out there are only three possible sources of critical assessment of student performance: the student, an evaluating device, and the monitor[58]. As lack of knowledge and experience eliminates the first, and finance and inadequate research the second, we are left with dependence on a monitor.

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[54] "Effect of Preliminary Training in Pronunciation Discrimination upon Learning of French Pronunciation with Recording Devices", Washington, (1961), abstracted by Keislar in Nostrand: *Research on Language Teaching*, Seattle, (1961, 2ed 1965), page 288.

[55] "Discrimination Training in the Teaching of French Pronunciation", *Modern Language Journal*, XLVII, (1963), page 203.

[56] "Methods for Self-shaping Echoic Behavior", *ibid.*, page 160.

To evaluate the success with which the objectives of language laboratory programmes have been realized, the experimenter can use a barrage of tests of the type described in the preceding chapter. To determine whether immediate reinforcement, active responding to stimulus items and minimal step progression at the student's own pace where possible are more profitable than classroom instruction by a teacher for a commensurate

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57. Lane, reference in note 52 explains his experimental results in terms of the students' transfer of their first-language discriminations. (page 255).

58. "Toward a Redefinition of Teacher Role and Teaching Context in Foreign Language Instruction", Modern Language Journal, XLVIII, (1964), page 282.

period of time, results of experiments need to be closely analysed. The advantages and disadvantages of active responses plus immediate reinforcement in what has come to be known as an audio-lingual approach as contrasted with the multiple-approach method of teaching foreign language skills were demonstrated by Scherer and Wertheimer[59]. Given the validity of the carefully constructed German skill tests[60] and the comparability of groups[61], the results show that after two years of training in German the experimental group showed greater proficiency in the assimilation of meaningful material, and in the range of their active vocabulary and speech skills (accuracy of pronunciation, overall fluency and intonation, morphology and syntax employed)[62]. Meanwhile, conventional instruction led to better scores on the German writing and German to English translation tests[62]. In other words, the efficacy of the audio-lingual approach in teaching what it aimed at achieving was vindicated.

The desirability of daily language laboratory practice with the opportunity to work at one's own pace with recording/playback facilities was tested by Lorge in the ten New York City High Schools  She set out to compare achievement gains in fourteen language skills on the part of second year French students 1. with no laboratory practice, 2. with weekly audio-active drill, 3. with weekly record/playback exercises,

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[59] *A Psycholinguistic Experiment in Foreign-Language Teaching*, NY, (1964), pages 171ff discuss results.

[60] *ibid*., pages 108ff.

[61] *ibid*., pages 33ff.

[62] *ibid*., pages 211-212. Rivers, "The Colorado Experiment in Audio-Lingual Teaching", *Babel*, N S.,1,(1965), page 19.

4. with daily audio-active drill, and 5. with daily record/playback exercises. In reading aloud, all laboratory groups excelled in pronunciation and intonation while in fluency the weekly audio-active group alone were less proficient than students in conventional classrooms[63]. In overall performance of speech skills, the daily record/playback group were unexpectedly found to be superior to all others.

2.3 The foregoing experiments provide some evidence that certain aspects of Skinner's behaviorist theory are justified: Lane found the use of reinforcement in discrimination training effective in the teaching of Spanish; Lane and Pimsleur both established the desirability of shaping behaviour by various forms of prompting; Scherer and Wertheimer vindicated the consistent use of overt responses in the audio-lingual method to gain proficiency in listening comprehension , speaking skills, reading comprehension and English to German translation[64]. How Skinner applies his theory to the work of preparing a programme needs further scrutiny.

In his programmed text: The Analysis of Behavior, Skinner sets out to teach the student basic terms and principles concerned with the prediction and control of human behaviour[65].

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63. Lorge, "Language Laboratory Research Studies in New York City High Schools: A Discussion of the Program and the Findings", Modern Language Journal, XLVIII, (1964), page 414.

64. Reference in note 59, page 212. See comment by Rivers, "The Colorado Experiment in Audio-Lingual Teaching", Babel, N S.,1, (1965), 2, page 20.

65. Reference in note 26, page vii. For the sake of convenience, further page references to this work will be inserted in brackets after the citation in this section of the thesis.

The programme is expressly designed to show the student how inadequate popular explanations of the field are and prepare him for applying his knowledge in related areas.

Skinnerian programmes like this one are called linear because the subject matter is developed in a logical progression of small steps moving without deviation towards a complete coverage of the topic. Some initial stimulation to arouse interest in the subject serves to give the student an idea of the type of response expected of him in much the same way as one of Skinner's pigeons in its box is deprived of food to ensure that it will eat the pellets it obtains, though this identification of student interest with "deprivation" is shown by Chomsky to be contrary to available evidence[66]. Thus Holland and Skinner begin their programme with:

> "A doctor taps your knee (patellar tendon) with a rubber hammer to test your ... 1-1
>
> reflex If your reflexes are normal, your leg ... to the tap on the knee with a slight kick (the so-called knee jerk). 1-2
>
> responds (reacts)" (pages 2 and 3).

Skinner continues the instructional sequence by attempting to shape the responses of the student in much the same way as he taught a pigeon to bowl[67].

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[66] Skinner's claim is made in the reference in note 1, pages 68, 141ff. Chomsky's reply occurs in "A Review of B.F. Skinner's Verbal Behavior", Language, 35, (1959), page 30, rp Fodor and Katz (eds), The Structure of Language, Englewood Cliffs, (1964), page 551.

[67] "Reinforcement today", American Psychologist, 13, (1958), page 95 also reprinted in his Cumulative Record, NY, (1959), page 132.

We notice the measure of recall involved in:

> "Onion juice elicits the secretion of tears by the lachrymal gland. This causal sequence of events is a(n) .... 1-25

reflex When speaking technically, instead of saying onion juice 'stimulates' tears, we say onion juice '....' tears. 1-26

elicits" (pages 2 and 3)

Skinner tends to confine his technique of shaping behaviour to the use of thematic prompts of the type:

> "The very 'frightened' person may break out in a 'cold....'5-19

sweat" (page 27)

while, on the same page, he tests the student's knowledge by a 'pure' frame:

> "Many different reflexes are observed in 'fear' or 'anger'. In emotional states, many responses are . , by a common stimulus. 5-28

elicited" (page 27)

or to take a clearer example from the closing stages of the programme:

> "In so-called self-control, the controlling response is established through .... Usually this takes place through the reduction of the .... associated with the controlled response. 53-10

reinforcement, aversive stimuli" (page 333)

Since the programme takes some fourteen or fifteen hours of study for its completion[68], the use of a greater variety in the types of prompt might improve it. Throughout linear programmes, answer keys are provided because it is thought that the student is positively reinforced when he sees that his constructed response agrees with that suggested by the programmer. Reinforcement is presumed to be negative when the response and the answer key do not correspond. This presupposes that the learner gets satisfaction from finding out that his answers are right or that he is upset when he is wrong - a supposition to which the writer returns in Chapter V.

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[68] A.C.E.R. Catalogue of Programmes in the Library, 10/4/1964, Melbourne, page 5.

Not all the material to be learnt in a linear programme is presented in teaching frames. The use of "panels" or "exhibits" is demonstrated in the _Analysis of Behavior_[69], some being summaries to be read before beginning the chapter[70], some as descriptions of experimental work not to be read until relevant explanation has been furnished, some as paradigms to be employed as mnemonic devices. As a teaching procedure, exhibits can be included in a programme without requiring the student to memorize the material immediately. It is worth noting that nothing of equivalent function has ever featured in the experimentation of animal learning which was the supposed foundation of linear programming. We may well ask whether these introduce a new element which invalidates to some extent the theoreticl model.

In the field of human learning, the most relevant study for our purpose that Skinner has published is entitled _Verbal Behavior_[8]. It is an attempt to identify and study the changing influences on a speaker's verbal responses. With some refinements, verbal behaviour is defined as "behavior reinforced through the mediation of other persons[71]", a definition Skinner considers applicable to all social behaviour[72]. The introduction of the listener's reinforcing the speaker's behaviour as an element in the definition does not save the situation as the mediating listener can scarce be thought to reinforce the speaker on the many occasions when he makes no observable response to the speaker. In a total speech episode, there is usually interaction between speaker and listener and verbal behaviour can be considered from the viewpoint of either. "Verbal behaviour" extends beyond words to the reactions of an organism as a whole to a social environment as manifested in his postures, facial expressions, gestures, pauses, intonation and exclamatory noises[73]. To what extent the latter need to be taught in the foreign language classroom is a question of objectives many teachers prefer to overlook Generally with Skinner, teachers will classify among the objectives to be taught in the field of verbal behaviour the phonic phenomena to be recognized and produced[74]. Standards of speech production are established which can conveniently be identified by the formants of the sounds in question[75]. Morphemes can be most usefully listed in conjunction with the verbal repertoire - the collection of verbal operants which the foreign language student is expected to be able to use in appropriate situations[76]. As a Skinnerian programmer, the teacher must increase the probability of the student's emitting the formulas expected of him according to a pattern approximating in form and content to the objectives specified. The experiments so far described indicate how much this is possible.

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[69] pages 14, 20, 35, 46, 72, 78, 88, 97 ....

[70] See section 5 4 of Chapter V, and the apparent borrowing from Gestalt theory there discussed.

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[71] Reference in note 8, pages 2 and 14. The complimentary study Science and Human Behavior, (reference in note 1), was developed concurrently. Verbal Behavior was available in a mimeographed version after 1948 as the William James Lectures.

[72] ibid., page 224.

[73] West: "Learning English as Behaviour", English Language Teaching, XV, (1960), page 3. Skinner, however, sets no limits to "verbal behavior" except to rule out intonation as a matter worthy of consideration in English.

[74] Reference in note 8, page 15.

[75] Reference in note 52, page 265.

When it comes to the question of response-strength, Skinnerian theory appears inappropriate. Skinner distinguishes between the all or none measure of whether the student says anything or not and can give no method of determining whether delay in reply is due to ignorance or to some trait of character in the speaker. He considers that response strength with due provision for personality variables, is indicated by energy-level, the speed with which the operant follows the stimulus, and such repetitiveness as is not prompted by psychologically aversive conditions[77]. While Skinner's exclusive dependence on examples of native language use suggests that some applications of his remarks to foreign language learning could be unwarranted, anomalies result unexpectedly when applying his theories to the use of the native language. According to Skinner's logic, a girl would not really appreciate her engagement ring unless her thanks were instantaneous and profuse the minute her suitor presented it to her, yet most boys would prefer to hear a soft, murmured "It's magnificent" rather than an excited: "Thank you, thank you, thank you!" However, if response strength cannot be measured in a Skinnerian way when it comes to verbal behaviour, Skinner's emphasis on using language formulae in the early stages of language learning has, to the delight of teachers and students alike, compensated for the tendency in some classrooms to learn much about a language instead of learning to use it accurately. Complete absence of any trace of intrinsic or extrinsic satisfaction accompanying performances of language skills, as has so often been the case in the past, can only lead to their eventual extinction, as can be readily seen with children when their parrotted prayers cease to make sense either to themselves or to their listeners.

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[76] Reference in note 8, page 21
[77] *ibid*., pages 25-26

Criticism of Skinner's theories and viewpoints is evident in each of the approaches to programmed learning described in the chapters which follow. As a linear programme designed to teach French pronunciation is evaluated in Chapter VIII, further discussion of the approach will be postponed until then.

## CHAPTER III · INTRINSIC PROGRAMMING

3.1 Crowder opposed the Skinnerian model over errors

3.2 Rationale of intrinsic programming:

- cater for individual differences
- give remedial instruction through branching
  - first order - return to main stream
  - second order - sequences
- response mode
- format: confirmation, information, further probing
- complex presentation devices

3 3 Debate between Skinner and Crowder and its outcome

3.1 To Crowder, the difference between one student and another learning the same material was not merely a difference of speed in completing an assignment. It seemed that individual differences were revealed essentially by the errors students made in answering test questions about the instruction given or the information read Crowder was convinced that students would make mistakes and set about devising a system which could cater for error in the learning process.

The same problem confronted Crowder and Skinner: both sought an effective means of communicating information and developing skills in humans. Skinner's linear programmes exploit behaviorist theories of learning. Crowder, if neo-behaviorist in outlook, prefers to ignore theories of learning and concentrates on a technique of instruction which caters for individual differences and the remedying of errors. He does not endorse Skinner's assumptions that there are many valid analogies between animal learning and human learning. In fact, he disavows the learning model of free operant conditioning exploited by Skinner[1] . His own programming is based on a different rationale and makes for greater flexibility in the order of presentation of learning materials[2] . In the sense that the remedying of misconceptions is effected by provisions made within the programme, Crowder is justified in calling his approach "intrinsic".

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1. Crowder: "On the Differences between Linear and Intrinsic Programming", *Phi Delta Kappan*, 44, (Mr 1963), pp 250-254 reprinted by de Grazia: (ed): *Programs, Teachers and Machines*. NY, (1964), page 78.
2. Richmond: *Teachers and Machines*, London, (1965), page 49

[illegible]

was an intrinsic part of the learning process, Crowder considered the response a test of proficiency which determined what part of the programme should be presented next. The main stream of an intrinsic programme need not of its essence be vastly different from a linear programme because students making a correct response are informed that they are right and presented with a further step in the logical sequence. What makes intrinsic programming different is not so much the format but the attempt to cater for idiosyncrasies of students who make mistakes and whose erroneous responses lead to "branching" in the instructional programme[3].

The small steps of an "intrinsic" or systematically "branching" programme are invariably much bigger steps than those Skinner recommends. Each frame, occupying a paragraph or two of print - sometimes even two pages, presents a single item or aspect of a subject in anything from fifty to five hundred words. The style of instruction adopted matches that of lucid text-book writers[4]. The instruction is followed by a test, for convenience' sake a multiple-choice test containing two or three options. Each option is linked with a reference

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[3] Crowder: "Programmed Instruction compared with Automated Instruction", in Ofeish and Meierhenry (eds): Trends in Programmed Instruction, NY, (1964) page 30.

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[4] Crowder: "Intrinsic Programming: Facts, Fallacies, and Future", (the initial part of which was first published as "The Rationale of Intrinsic Programming", in Programmed Instruction, I, (1961), no 5) in Filep (ed), Prospectives in Programming, NY, (1963), page 105.

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to the materials appropriate for that particular response. The resultant branching is of two kinds.

In first-order branches, the student is told he is wrong and why he is wrong. Frames in the main stream of the programme by way of contrast tell the student he is right and why he is right. Crowder makes the point that the student must in both cases be reminded in some way of the test question and be confirmed in recognizing his choice as right or wrong[4]. Given this much, the first order branch simply directs the student back to the test item on which he previously failed and asks him to choose again[5]. On other occasions, a series of remedial frames called second-order branching is devised to help less competent students to come to grips with the subject[5]. The advantage of this remedial series is that smaller steps can be provided or a fresh approach adopted to facilitate understanding. It can involve instruction in fundamentals by regression through subject-matter previously presented or it can be supplementary information normally part of the average student's background knowledge.

Not all branching away from the main stream of an intrinsic programme needs to be purely remedial. An uncommonly perspicacious student, one for example who when studying the comparison of adjectives in French reveals an understanding of the use of "ne" in the dependent clause, may be allowed to follow a series of "enrichment" frames dealing as much with

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5. *ibid.*, page 35.

stylistic considerations as with grammatical ones[6]. Again a student of French literature engaged in reading a book by Stendhal could be led to see the book in relationship to other writings by the same author or by his contemporaries if he displayed a precocious understanding of the import of the work. According to Crowder, there is nothing to be gained by boring a student with a revision of ideas he has already worked out for himself.

This concept of branching is not to be confused with another desirable feature of many programmes: provision for skipping frames so that when the learner demonstrates a satisfactory degree of proficiency on the subject-matter tested, he is not required to plough through all the examples given. If a criterion test is correctly answered, steps in the mainstream of the programme can be skipped. Professor H. A. K. Hunt's Practice Lessons on Dependent Clauses in Intermediate Latin adopts this technique in cases like:

> 55 "If you got proficisci debuit right, go to 71.
> If you got it wrong, go to 56 (next item)" [7].

Failure to perform satisfactorily on a criterion test will provoke a series of frames providing information not previously learnt, not fully understood[8], or simply forgotten, or a direction to revise an earlier section of the programme which

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6. Brethower: Programed Instruction: a manual of programing techniques, Chicago, (1963), pages 81, 83 etc. frames 251, 252 etc.

7. Melbourne, (1963), Volume I, page 12.

8. Markle, Words: a Programmed Course in Vocabulary Development. Chicago, (1962), page 4.

gives the necessary clues to master the point being assessed.[9]

To achieve branching or skipping, alternative responses to a test need to be linked to appropriate directives as to what the student should study next. Crowder's test items provide multiple choice options which have led some programmers to place excessive emphasis on the response mode[10]. The advantages of multiple choices nevertheless deserve attention here for wrong responses could be diagnosed as indicating defective understanding of the instructional passage, inability to extrapolate knowledge or skill acquired to a particular situation, or questionable evaluations of instances presented. Whichever option the student selects, Crowder makes a point of telling the student he is right or wrong without necessarily revealing the right answer to the ignorant student - something Skinner could not avoid disclosing. As a matter of fact, an adherent of Skinner's theory would have to admit that Crowder positively reinforces the right response, negatively reinforces the erroneous response, and achieves much more besides. When a student is right, he is told why he is right and given further instruction; if he is wrong, he learns why and is led to a situation where he can gradually work to achieve understanding. Prompts occur in intrinsic programmes not so much to force a correct response but rather to provide extra clues where sheer instruction does not suffice   In intrinsic programmes, the response is not considered part of the learning process and is not elicited after only a few words of textual instruction   Its role is to make possible a readjustment of the teaching materials or approach to suit the particular needs of the student,  Skinner claims that multiple-choice tests merely call for a recognition of the correct response or induce a student into error,  In a sense this is true; often enough an alternative to a correct answer is purely the ignorant layman's reasonable guess at an answer and if chosen indicates lack of comprehension   It is possible, however, to include more searching tests where each of two or three choices measures skill in applying knowledge to a particular case[11] .  The extent to which Skinner's criticism is appropriate in this case is less clear for the multiple-choice test now performs the same function as a "pure" frame in a linear programme if in a different way.

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[9] ibid., page 5 refers to Coulson and Silberman's work: "Effects of Three Variables in a Teaching Machine", Journal of Educational Psychology, 51, (1960), pp 135-143. It indicates that the rapid progress made through a branching programme as opposed to a linear one does not lead to the same level of proficiency on the part of the student who sometimes must revise material to gain overall mastery

[10] Crowder - reference in note 3 above, page 29.

Each frame of an "intrinsic" programme contains a variety of material.  Every item begins by presenting knowledge of results:  the student is told whether he was right or wrong in the test item he has just completed and the answer is restated to clarify what is involved.  Only the initial section of a new unit of material may omit emphasis on showing how one step leads to another   The transition from frame to frame is facilitated by stating briefly why the answer is acceptable or erroneous, a detail particularly important in a remedial sequence which deviates from the main stream of the programme. The precise function of every part of an instructional frame may be overlooked by the uninitiated. From the point of view of the writer of an intrinsic programme, procedure is not as clearly defined as Skinnerian programmers might wish, and a measure of flexibility and variety is apparent in the frames of successful intrinsic programmes. However, Crowder has devised some "useful rules about how to write pages"[12]. The communication of information follows the principle of clarity at the expense of completeness and sustaining motivation by conversational style rather than lapsing into cold reporting of fact. The point of the exposition needs to be suitably tested, not by trick questions but by coordinate alternatives which allow the branches to develop towards the same eventual goal. The multiple-choice items concluding the frame are more than a mere test of comprehension of some aspect of the topic discussed. Crowder is anxious that students be in some sense committed to the answers they choose and not merely enticed to register in passing what response was acceptable and what not. He implies that the technique of checking one's constructed response against a right answer key can lead to just such a notional assent in the student who makes mistakes.

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[11] Crowder, reference in note 1 above, page 84.

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12. reference in note 4 above, page 105.

Complex presentation devicesfor intrinsic programmes still use the same type of material ~~as~~ is incorporated into Crowder's "scrambled" text-books. Whereas the text-book requires the student to turn backwards and forwards through the material, following the page numbers appropriate to the answers he adopts, the Autotutor selects the part of the presentation film to be studied according to the button pressed by the student. The Empirical Tutor permits of controlling two ancillary units - audio and visual by the coding punched along the side of the paper rolle employed as a presentation device for the programme. A student in Education can be asked:

10 "If on entering the classroom, the teacher finds
two boys fighting in a corner, should he
i) send both boys to the headmaster BUTTON D
ii) tell the boys to sit down and see him after class BUTTON F
iii) make an example of the boys there and then in front of the class BUTTON B
iv) ignore the whole matter BUTTON A "

On pressing a button, the student teacher can see and hear what would happen if he exercised his authority in any particular way or the consequences of ignoring the breach of discipline. The possibilities for the learning of situational dialogues in a foreign language and the choice of apposite foreign language comments in particular circumstances does not need to be underscored.

3.3 Of far greater importance than the question of presentation devices is the debate between Skinnerian behaviorists and advocates of intrinsic programming on the theoretical issues at stake.

When programming was in its infancy, an argument arose over making presentation devices cheat-proof. Skinner felt that only the use of a "teaching machine" would prevent a student from peeking at the answer without the teacher's being aware of it From experience, the writer has found that students rapidly learn that consistent cheating only defrauds themselves No one is deceived about whether students learn from the programmes because failure to succeed in routine tests readily identifies the slacker and the dishonest, Linear programmes presented in book formats of various sorts make it easy for students to peep at the expected response; adjunctive programmes with keys provided within the same booklet or folder fall into the same group Whether students cheat or not now seems unimportant, because many who have occasionally peeped at correct answers have been shown to perform equally well as those who do not The only valid conclusion from experiments on "cheating" is that Skinner's insistence on the necessity of using teaching machines seems in most cases unfounded[13].

Crowder from the outset considered presentation devices inessential. His scrambled text-books make attempts to defeat the system utterly pointless and punishing. Complete loss of logical connections between pages results; without understanding the perusal of pages is frustrating. Sometimes opposite pages contrast right and wrong answers; usually there

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13. Branson, "Some Pitfalls in the Classroom Use of Programs", Ofiesh and Meierhenry (eds), Trends in Programmed Instruction, NY, (1964), page 78.

is no real relationship between the topics created. Attempts to try out all the answers in turn until the correct one is found involve far more work than thinking out the right answer and a reading a sequel adapted to one's own thought processes. The sheer irritation of wading through pages of unintelligible text quickly persuades a student that it is more pleasant and more profitable to be honest, to have one's errors corrected by suitable remedial instruction and so move step by step to the satisfaction of understanding the subject matter.

In acrimonious debate with Skinner, Crowder maintained that differences between students was manifest in the errors they made and from which they learnt[14]. He suggested that particular misconceptions suggest themselves from the subject matter in a sequence of frames, and can be foreseen and provided for readily enough[15]. He wanted to challenge students even at the risk of error and, as Thorndike advocated, set out to adapt the teaching on the basis of diagnosing lack of comprehension[16]. There seems to be inconsistency in Crowder's objecting to Skinner's efforts to eradicate error when he himself expresses the desire to limit the number of mistakes students can make. He finds deliberate obscurantism unpardonable, and seeks to circumvent opportunities for misunderstanding by extending the exposition of the subject-matter for the slow learner. In contrast, he expects a percentage of students to be attracted to choosing wrong answers among plausible alternatives in a multiple-choice test of comprehension, otherwise his tests become pointless and the remedial branching frames superfluous. The enigma of his attitude is resolved by distinguishing between items which separate students onto different branches of the programme (second order branches) and those where student errors are caused by inattention or carelessness - qualities never commendable and which are catered for by first order branches where the student is told to think again and settle down to serious work. These frames serve to upset the cock-sure and prod the unthinking into activity. The occasional slip is a spur to renewed effort and concentration. When no student ever makes a mistake, the chances are that the exercise of going through the programme has been largely a waste of time[17].

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[14] Reference in note 1, page 83.

[15] Reference in note 4, page 107.

[16] ibid., page 106; reference in note 1, page 81; and Hilgard, Theories of Learning, NY, 1948, 2ed 1958, p 23.

Four experimenters took one of Crowder's texts: the Arithmetic of Computers and presented it as printed, a scrambled text-book, to about a third of the students with whom they worked. The two other groups had versions of the text omitting all wrong answer pages (linear version) or all tests (unprogrammed text). None of the groups showed significant differences in performance in a final test of achievement. The linear programme was briefer and so appeared to have economic advantages over the rival forms. The finding[18] reinforces the conclusions of Challinor who devised multiple-choice and con-

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17. Crowder, reference in note 4, page 108.

18. Senter, Heiberg, Abams, Morgan: "An Evaluation of Branching and Motivational Phrases in a Scrambled Book", Programmed Learning, Volume I, (1964), page 133.

structed response linear programmes to teach four spelling rules to eleven-year olds. The falsifying element in Challinor's experiment is that the students had to read considerably more in the multiple-choice programme which merely added possible answers to the constructed response version. No significant differences, except consideration of economy, were found between the two programmes[19].

Branching dependent on multiple-choice tests raises the question of the theoretical justification for preferring a variable sequence of items to the fixed sequence demanded by the proto-type of linear programmes[20]. One argument often advanced in favour of intrinsic programmes is that they provide for the individual differences of the members of a class[21]. It is claimed that brighter students get tired of the redundancy in a linear programme pitched at a level far below their standard and are frustrated at the slow pace at which such an exposition develops. Less intelligent students never really get explanations to rectify their misconceptions during linear programmes, a factor which slows up the conscientious and makes some others think education a waste of time. But there is no evidence to show that a page written by an intrinsic programmer to suit the average youth of eighteen would also suit one who was four years younger though talented enough to understand the subject-matter Whether the student is bright or dull, young or old, not only classroom instruction but also programmed material must be geared to the level of achievement, ability, interests and development of the listener or reader. If a scrambled text-book is in fact many books in one and student D who is dull reads a different text-book from student B who is bright, while C who is in between can benefit from reading material designed to teach both the others, then the expense involved in its production seems justified[22]. In such cases each student generates his own best sequence of items to master the programme content more effectively[23].

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[19] "A Comparison of Multiple-Choice and Constructed-Response Programming of Four Spelling Rules", Programmed Learning, I, (1964), page 68.

[20] Silberman, Melaragno, Coulson and Estavan, "Fixed Sequence versus Branching Auto-instructional Methods", Journal of Educational Psychology, 52, (1961), rp. in De Cecco (ed), Educational Technology, NY, (1964), page 153.

[21] Taber, Glaser, and Schaefer: Learning and Programmed Instruction, Reading, Massachusetts, (1965), page 137.

There is no experimental evidence for Crowder's claim that intrinsic programmes use to the full the ability of humans to handle symbols[24]. He considers students must learn to think out problems and arrive at analyses and evaluations of the material before them[25]. Errors caused by stretching students beyond their capacity are excused in his eyes[26], but there is no room for mistakes generated by poorly written, obscure or diffuse materials. Crowder makes a point of ensuring that remedial frames pose questions probing enough to require thought and not just a cursory glance at the page to recognize the answer to a test question. If in fact students do think and do learn Skinner would claim that it is not thanks to Crowder because intrinsic programmers do not set out to teach students how to think. To Crowder, however, it is not *how* the student learns but *whether* he learns that is important. The intelligent student covers a course in fewer pages through working over the most advanced material in an intrinsic programme. The experiments attempting to determine superiority of one programming style over another have always failed to take into account that this approach is very different from Skinner's insistence that every student cover the whole of the programmed material irrespective of ability. It is therefore not necessarily the more intelligent reader but the faster reader who is favoured in linear programmes. Further, linear and branching programmes do not differ in externals like response mode only, but in the very nature of the ways in which goals are reduced to instruction in the body of the programme. One such crucial issue is the hotly contested question of step-size.

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[22] Crowder, see reference in note 4, page 87.

[23] Markle, Eigen, Komoski: A Programed Primer on Programing, NY, (1960) Volume I, page 17; Lumsdaine: Student Response in Programmed Instruction, (A Symposium on experimental studies of cue and response factors in group and individual learning from instructional media - Washington, D.C., (1961)), page 41.

[24] Crowder, see reference in note 4, page 87.

[25] Crowder: "Automatic Tutoring by Intrinsic Programming", in Lumsdaine and Glaser (eds): Teaching Machines and Programmed Learning, Washington D.C., (1960), page 287.

Crowder staunchly opposed Skinner, rightly or wrongly, on how much to expect students to learn at every frame. Neither wanted to frustrate students by having them work on materials beyond their capacity. When individual frames or items caused students excessive difficulty, Skinner wanted all students to work through supplementary explanation breaking the content into minimal steps that could give noone any difficulty Crowder preferred that individual students be branched off onto materials they personally could manage, while the troublesome frame if needing to be revised at all should in general be combined with another item to increase the step size[27]. Exposition in the main stream of intrinsic programmes was usually to be refined in the direction of keeping the density of content high on the grounds that most students are stimulated by more challenging material. If branching suitably takes care of the student who makes a mistake, it seems doctrinaire to accept Skinner's behaviorist prejudices as indispensable elements of programming. Indeed, recent experimentation appears to disparage the Skinnerian emphasis on constant overt responses

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[26] Crowder, see reference in note 4, page 89.

Stolurow and Walker working with psychology students in a university found that there was no significant advantage in making responses overtly[28]. They did note that covert responses made for faster learning. Alter and Silverman corroborated this finding when they gave a linear constructed response programme to 90 university students studying basic electricity[29]. When testing the programme with 60 students two years earlier, they formulated the finding that students who simply read items learned significantly more than those making active responses[30]. Sidowski, Konstein and Shillestead took both the time factor and the efficacy of learning 15 Russian-English paired vocabulary items with 120 college students and found covert responses more efficient than overt[31]. The refrain from experimenters time and again: Hughes with 129 adults[32], Krumboltz with 54 undergraduates[33], Lambert with 552 9th graders[34], and Keislar with 198 primary children[35] remains: no significant difference in amount learnt but the time factor favours covert responding. Maguire concurs when work is fast, but when presentation is slow he favours Cummings' finding that retention is favoured by overt responses[36].

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[27] Reference in note 4, page 109.

[28] "A Comparison of Overt and Covert Response in Programed Learning", Journal of Educational Research, 55, (1962), pages 421-432.

[29] "The Response in Programed Instruction", Journal of Programed Instruction, I, (1962), page 60.

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30. "Note of the Response in Teaching Machine Programs", Psychological Reports, 7, (1960), page 496.

31. "Prompting and Confirmation Variables in Verbal Learning", Psychological Reports, 8, (1961), pages 401-406.

32. "Effect of Changes in Programed Text Format and Reduction of Classroom Time on the Achievement and Attitude of Industrial Trainees", Journal of Programed Instruction, 1, (1962), pp 43-54.

33. "The Effect of Overt vs Covert Responding to Programed Instruction on Immediate and Delayed Retention," Journal of Educational Psychology, 53, (1962), pages 89-92. The experimenters Krumboltz and Weisman found that a further post-test two weeks later favoured overt responses.

34. with Miller and Wiley: "Experimental Folklore and Experimentation: The Study of Programed Learning in the Wauwatosa Public Schools", Journal of Educational Research, 55, (1962), pages 485-494.

35. with McNeil, "A Comparison of Two Response Modes in an Autoinstructional Program with Children in the Primary Grades", Journal of Educational Psychology, 53, (1962), pages 127-131

36. Maguire: "Audience Participation and Audiovisual Instruction: Overt-Covert Responding and Rate of Presentation," in reference in note 23, pages 417-426; Cummings and Goldstein: The Effect of Overt and Covert Responding on Two Kinds of Learning Tasks, NY, (1962). The 119 frames of diagnosis of myocardial infarction took slow workers nearly a minute per frame (overt) while the faster students using covert responses took half that time. Results in this study are invalidated by the exposure time and testing procedure.

Probably the most important finding in experimentation on the nature of responses was that of Eigen and Margulies who noted that there was no significant difference with material of low information content, but that overt responses favoured retention when the information level of the programme was raised[37]. What Krumboltz and Weisman, Maguire, Cummings and Goldstein all forget to do is to examine the influence of exposure time when overt responses are made on the eventual long term retention. It seems feasible that the sort of repetition necessitated by having to make an accurate overt response could be matched by having covert responders repeat the programme, thereby making sure that no significant differences between either experimental group vitiates the interpretation of results obtained.

Skinner favours constructed responses in linear programmes Crowder points out how difficult it is to predict constructed responses in "pure" frames and how only prompts and prior instruction can limit the number of possible errors[38]. Markle goes further on some occasions, and makes no attempt to predict what reply the student will make When the student checks his answer with the key, he finds a formula like: "Your answer"[39]. This is as if to say that every individual will have his personal opinion about some issues and the programmer has no intention of siding with any particular standpoint. Since no branching is [illegible] possible in such instances, the reader can do nothing other than proceed to the next frame. In some cases, constructed responses can amount to "yes" or "no", "true" or "false"; in binary arithmetic, there are two possibilities for each location; in other fields, and especially where language is involved prompts alone can limit the number of erroneous responses that can be dreamed up by an ignorant student Galanter early suggested that the subject-matter should determine what sort of response is elicited[40]. Where a choice between alternatives is called for, as is frequently the case[41], Crowder's method seems preferable. Markle's discussion of Skinner's and Crowder's outlooks on programming leads to a single conclusion: the need for research. She claims Galanter's suggestion unfounded, and shows in print how effectively branching can be introduced to an otherwise linear programme[42]. Conscious of the unwarranted dogmatism of some programmers, Markle in her Programed Primer on Programing demonstrates how to explain one's point of view without forcing the student to agree.

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[37] "Response Characteristics as a Function of Information Level," Journal of Programed Instruction, II, (1963), page 45.

[38] Reference in note 1, page 34.

[39] op.cit., Volume I, page 22.

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[40] "The Ideal Teacher", in Galanter (ed): Automatic Teaching: the State of the Art, NY, (1959), page 8.

[41] Lumsdaine, reference in note 23, page 43; Markle, op.cit., Volume I, pages 16-7.

[42] reference in note 8, pages 102 ff.

## CHAPTER IV: ADJUNCTIVE PROGRAMMING

4.0 Pressey's first "teaching machines" dependent on testing

4.1 Immediate knowledge of results

4.2 Self-pacing

4.3 Diagnosis and remedying of errors

4.4 Multilevel theory and practice

4.5 Carroll's cyclical programming the natural outcome

4.6 Application to the language laboratory

4.0 Pressey, the writer both Skinner and Crowder acknowledge as the prime inspiration of the programming movement[1], reviews developments with the comment: "Enthusiasts carry a new idea to extremes"[2]. He notes that several experiments seem to agree that in a given time, their programmed materials produce "no more learning, than if that same material were organized in continuous discourse"[3]. The implication is that both Skinner and Crowder who in their own ways have departed from the pattern of the earliest teaching machines, would do well to take note of what adjunctive programming offers.

Testing procedures seemed unnecessarily burdensome to Pressey; essay questions were to his mind demonstrably inadequate for evaluating student performances; the objective testing he preferred could be streamlined to the point of being self-scoring[4]. Self-scoring devices had the added advantage that students found out immediately whether their responses were right or wrong. When wrong, students were in a position to try and establish the correct answer without delay by a process of elimination. Of four possible multiple-choice options provided by Pressey's device, students could successively choose answer after answer until they found the most satisfactory Given an initial presentation of material by lecture, film, or text-book, students could teach themselves the essential points by using Pressey's testing device to attempt a multiple-choice test on the subject. Subsequent reading and discussion to acquire more information and stimulate thought were not to be superseded by automating examinations. Pressey in the light of the psychological "laws" of his day was taking the opportunity of turning a testing situation into a learning experience.

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[1] Skinner: "Teaching Machines", Science, 128 (1958) pages 970-971, reprinted in his Cumulative Record, pages 170-171. Crowder: "Automatic Tutoring by Means of Intrinsic Programming", in Galanter (ed): Automatic Teaching the State of the Art, NY (1959) page 109.

[2] "Basic Unresolved Teaching-Machine Problems", Theory into Practice, 1 (1962), page 37.

[3] ibid., page 32. The experiments are further analysed in his "Some Perspectivesand Major Problems Regarding 'Teaching Machines'", published by Lumsdaine and Glaser (eds): Teaching Machines and Programmed Instruction, Washington, (1960) pages 500-501.

[4] Pressey, "A Simple Apparatus Which Gives Tests and Scores - and Teaches", School and Society, 23 (1926) reprinted in reference cited in note 3, page 35.

4.1 Pressey's emphasis on immediate knowledge of results is tied to the law of recency. The student, it was claimed, retained most vividly what he had met most recently. In the teaching mode, Pressey's testing machine always presented the right answer last in association with the test item. The deduction was that students finding out the correct answer would be favoured in tests of retention of information at a later date. Pressey conducted experiments which could be thought to have produced evidence that the law of recency operates in such cases[5].

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[5] "Some Perspectives and Major Problems Regarding 'Teaching Machines'", in the reference quoted in note 3, pages 501-502. He derives further support from the studies of Jones: "Integration of Instructional with Self-scoring Measuring Procedures", Abstracts of Doctoral Dissertations, 65, (1954), pages 157-165 and Stephens, "Certain Special Factors Involved in the Law of Effect", ibid., 64, (1953), reprinted pages 89-93.

Goldstein endeavoured to determine whether immediate knowledge of results helped or hindered students to better their scores on tests[6], and his finding that there was no significant difference in performance appears to cast doubts on the law of recency. What Goldstein fails to mention are the various experimental studies which establish the superiority of some form of programming with knowledge of results over standard lectures[7].

In presenting work to the student, the adjunctive programme as conceived by Pressey, supplements initial presentation of subject-matter with an objective test for self-instructional purposes This transforms the nature of the learning experience. From the outset, attention and motivation are enhanced by the awareness of the students that the knowledge gained in the film, lecture, or text-book introduction is shortly to be examined. Secondly, the student who responds satisfactorily receives immediate confirmation of his right answer, while the student who fails is punished by his inability to perform at the required level of competence[8]. When Pressey's device is employed in its teaching mode, the student must continue working till he finds out the correct answer and repeat the item along with others missed in second and third attempts at the programme[9]. In 1960, Pressey in a footnote to a reprint of this discussion suggested that younger students could easily be given candy or trinkets dispensed after every two, ten, or twenty right answers. He points out at the same time that the law of frequency favours the retention of the overwhelmingly predominant correct responses, while the law of exercise reinforces this tendency[10].

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[6] Research in Programed Instruction: an Overview, NY, (1963), p.3.

[7] Row and others: Automated Teaching Methods Using Linear Programs, Los Angeles, (1960), 57 pages.

[8] Pressey: "A Machine for Automatic Teaching of Drill Material", School and Society, 25, (1927), reprinted in reference cited in note 3, page 45.

[9] reference in note 4, page 37.

It occurred to Pressey that he could use 5" x 3" catalogue cards to record student answers on adjunctive programmes without having recourse to machines. Two quite thin and light pieces of cardboard have holes drilled through them according to a pattern twice repeated of ten lines of four holes less than half an inch apart. Between the pieces of cardboard, a record card is placed in such a way that a student can record his name, the date, and the test number, without being able to see through the cardboard to the right answer key below. This key is a similar piece of cardboard with holes drilled in the positions corresponding to right answers on the adjunctive programme. A backing sheet is screwed onto the stack of cardboard to keep the pile together and prevent a student's cheating when he records his answers by pressing his pencil into the hole corresponding with the option chosen. If the student is correct, the pencil hits the backing sheet and tears a large circle in the score sheet; if wrong, only a pin prick indicates that the pencil touched the answer key and failed to penetrate. Visual scanning of the scoresheet permits of establishing quickly how many responses were satisfactory, how many not When the student is instructed to find out the correct answer to each test item, the assortment of pinpricks in each row of the scoresheet indicates which wrong answers were chosen. Pressey's preoccupation with saving time, space and money led him to design an aluminium counter with spikes to count right and wrong answers[11]. Hence, too, his development of the punchboard years after the initial complex press-button self-scoring testing machine.

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[10] Reference in note 8, pages 44 and 45.

Pressey noted that if a small number of punchboard keys were utilized in random order, students could never establish the pattern of correct answers on the various tests and adjunctive programmes given them. In Australia, Pressey's work suggested to Stankunavicius that Hollerith cards could be used for recording answers to objective tests, allowing both for visual scanning[12] and for scoring with a photoelectric cell which identifies the contrast between light and dark squares on the card[13]. Squares totally filled in do not permit the cell to record a contrast any more than squares left blank. If then a student wishes to change his mind about his answer, he has only to blacken out a whole square and tick another The disadvantage of electronic scoring devices in the opinion of the writer is that they do not give the student immediate feedback whereas Pressey's punchboard and mechanical tester do. Richmond cites Goldstein's report quoted above as evidence that immediate feedback is not important[14]; but Pressey's students reported increased motivation due to this very factor and demonstrated in their test-scores that their level of achievement surpassed that of control groups without punchboards[15]. Pressey had originally been troubled that the persistence of erroneous responses might drill mistakes, but later noted that his demanding at least two successful attempts at a question before releasing a student from the chore of working over the material obviated that difficulty[16].

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[11] "A Third and Fourth Contribution toward the Coming 'Industrial Revolution' in Education", School and Society, 36, (1932), reprinted page 49 - scoring device. "Development and Appraisal of Devices Providing Immediate Automatic Scoring of Objective Tests and Concomitant Self-Instruction", Journal of Psychology, 29, (1950), reprinted in reference cited in note 3, pages 70ff.

[12] "Dr. Hollerith's Technique", Lab-Talk, No 8, (1965), pages 4 & 5.

[13] Lector - specification folder page 1. (English Electric-Leo Computers).

Briggs considered this adjunctive programming effective when the objective was remembering rather than understanding[17]. His contention is that the approach can only be used to support other classroom procedures, never to initiate the learning of new materials. If this is not sheer repetition of Pressey's own point of view, it might be construed as contradicting the outlook that two or three pages of adjunct questions could supplement difficult chapters of text-books to render teacher explanations and linear programmes unnecessary[18].

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[14] *Teachers and Machines*, London, (1965), page 37.

[15] second reference in note 11, page 80

[16] reference in note 8, page 45 poses the problem. First reference in note 11, page 50 suggests an answer.

[17] "The probable role of Teaching Machines in Classroom Practice", *Theory into Practice*, 1, (1962), page 48.

[18] Reference in note 2, pages 33 and 34. See summary page 37.

Without urging "gestalt" psychology as some programmers do[19], for Pressey like Skinner follows Thorndike[20], adjunctive programming is presented as the "explication and co-ordination of prior learning" gleaned almost intuitively from a rapid overview of the subject-matter and challenging objective questioning[18].

4.2 Pressey does not explicitly treat the question of pacing. The speed with which the student proceeds is by implication of his own making. But the implication is ever present in the many asides on the wasted time and trouble involved in numberless page turnings, excessive hand and eye movements involved in making constructed responses overtly. Pressey contrasts animal learning and human learning of meaningful material which thrives on the challenges afforded by large steps[21]. He looks for the elimination of excessively easy and verbose presentations, the reduction of paperwork He even proposes as a timesaver that a student's punched card of responses to a particular test could form the basis of subsequent study.

4.3 Given a copy of the original adjunctive programme used in association with the initial presentation of material, a student can readily see what points originally caused him difficulty and led him into error. In revising for exams, the student

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19. Rivers, *The Psychologist and the Foreign Language Teacher*, Chicago, (1964), pages 178-180 for the general *expose* and pages 122-123 for application to language learning.

20. Rivers, *ibid.*, pages 165-166.

21. Reference in note 2, pages 32-34.

can concentrate on his own weak points without wasting time on matter grasped from the outset From the teacher's point of view, numbered 3" x 5" cards in a filing cabinet can represent a diagnostic analysis of each student's strengths and weaknesses in dealing with course material. There is no need for a vast bulk of duplicated exam sheets or booklets if each card is coded for the name of the student, the number of the programme attempted on the punch-board, the subject content and the date of the performance[22].

4.4 Adjunctive programmes as Pressey conceived them are self-correcting multiple-choice objective tests. He made no particular provision for remedial instruction. Parker envisaged adjunctive programmes with some constructed responses and some multiple-choice options and devised a special technique for dealing with errors. In his S.R.A. Reading Laboratories, he adopted a multi-level approach with provision for progress as various reading skills were developed. He provided students with workbooks in which to record his answers and his raw scores. He insists that students write in correct responses to impress them on their minds, and not to proceed until they singly or with outside help come to understand why the answers are right[23]. "Power-builders" and "rate-builders" are treated similarly; the former

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[22] second reference in note 11, page 32.

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[23] Instructor's Handbook, Reading Laboratory IVa, Chicago, (1959), page 29.

allow students to work at their own pace and the latter require bursts of intense concentration for three minutes during which speed and accuracy are at a premium. According to Parker, the SQ3R (Survey, Question, Read, Review, Recite) study formula outlined in the workbook increases a candidate's chances of success on all Reading Laboratory tasks. This same technique is adapted to training listening comprehension skills. Instead of surveying the reading slection to get the gist of it, the student is counselled to think over what he knows of the subject to be discussed and try and predict the bias of the speaker[24]. While the speech is in progress, the student tries to anticipate conclusions and evaluate the logicality and validity of arguments put forward. Testing checks accuracy in identifying the implications of the lecture and, where notes have been taken, care in recognizing the extent to which points have been stressed. Parker recommends students to make the position of their notes on their workbook page meaningful in indicating the relative importance of subject-matter[25]; he might have added the use of coloured biros to code the nature of the comment recorded - black for verbatim reporting, blue for summary note-taking, red for the student's personal reflections etc. Thus attempts to extrapolate implications and applications would appear in red. In the key booklets, possible pitfalls in notetaking from the lectures included in Reading Laboratory IVa are pointed out: the danger of giving disproportionate emphasis to an example, the tendency to write too much too soon, failure to identify main points in a mass of statements

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[24] ibid., page 40

[25] ibid., page 72.

The desirability of freeing the teacher to tutor individual students in his class is emphasized by Pressey[26] and ignored by experimenters on programmed instruction[27]. The teacher variable is always extremely difficult to provide for in experimental work, but the value of adjunctive programmes in particular cannot be gauged until their efficacy is measured within the framework of an integrated curriculum. Whatever may be said of programmes as self-instruction devices, their role as tools for use by the teacher in class must not be overlooked. In the language classroom and especially in broadcast sessions in a language laboratory, the teacher's function is to diagnose and remedy student errors and difficulties[28] In evaluating language

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26. reference in note 8, page 46

27. Gentry and Vlcek, *Key Research in the Field of Programed Instruction*, covering Lumsdaine and Glaser's *Teaching Machines and Programmed Learning*, *AV Communication Review*, *Programed Instruction Bulletin*, *Journal of Educational Psychology*, *Journal of Educational Research*, *Journal of Education*, *Journal of Programmed Learning* and *Review of Educational Research*, (1964)

    Schramm: *The Research on Programed Instruction*, Washington, (1964), less perceptive and critical, does make some attempt to cover the extensive range of mimeographed reports.

28. Stack: *The Language Laboratory and Modern Language Teaching*, NY, (1960), page 48.

laboratory programmes prepared for partial self-instruction only, that is taking the role of the monitor into consideration, results are falsified if the teacher's contribution is disregarded It is the teacher's correct diagnosis which provides for individual differences in the level of performance in multi-level adjunctive programmes; it is the monitor's remedial instruction which makes many adjunctive language laboratory programmes efficacious learning materials. In every case, the teacher's role in presenting the lessons to which Pressey's programmes are "adjuncts" is presupposed[29].

4.5 Against this background, Carroll recommended the use of "cyclical" or "recursive" programmes. In the teaching of Mandarin Chinese, Carroll first presented the material to be learnt, added the question and answer phases typical of adjunctive programming, and organized his programme into loops, usually of forty to fifty frames each[30]. This loop was first studied by the students in a "familiarization" mode in which for each instructional item the student first read the exposition, attempted the task dependent on this, and compared his response with the programmed answer. Audio-visual instruction can accompany this sequence. Carroll had his students work through the materials two or three times before starting the "learning" mode in which the prompts contained in the instructional material are withdrawn and the identical text used to test proficiency. Like Pressey, Carroll is careful to point out the value of associating testing and teaching after the initial presentation[31]. The suggestion is made that there is great economy of material in these programmes and for total self-instruction purposes, initial presentation can be made in a linear form - a use Pressey envisaged for arithmetic and rote learning in a foreign language[32].

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[29] Zaccaria and Adams: "Adjunct Programming", in Ofiesh and Meierhenry (eds), Trends in Programmed Instruction, Washington, (1964), page 180.

[30] Programmed self-instruction in Mandarin Chinese: observations of student progress with an automated audio-visual instructional device, Wellesley, Massachusetts, (1963), MLAbstract number 554, reprinted in Nostrand et al. Research on Language Teaching, Seattle, 2ed (1965), page 60.

4.6 Given the basic introduction in class, some foreign language texts integrate some features of adjunctive programming in each lesson. A basic dialogue simulates a conversational exchange about a particular topic. Sentences are imitated, phrase by phrase, and if necessary repeated till memorized. One example of this is dialogue 9 of Le Francais: Ecouter et Parler[33]. The Question-Answer Practice which follows immediately is merely a type of drill which establishes the speech patterns involved in a quiz situation, while other drills substitute various vocabulary

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31. "A Primer of Programmed Instruction in Foreign Language Teaching", International Review of Applied Linguistics in Language Teaching, I, (1963), page 129.

32. Reference in note 2, page 32.

33. Côté, Lévy and O'Connor, NY, (1962), Teacher's Edition, pages 213ff.

items in these patterns. After establishing all the prerequisites the test situation characteristic of adjunctive programmes is introduced. Conversation 1 rings the changes on the basic dialogue and the student is asked a series of questions on the content of what he has heard. Factual questions precede others which are more personal to the individual student[34].

The adjunctive character of some materials for aural presentation in the language laboratory should be noted here. Intensive Spoken French Book I Lesson 4 first introduces a few lexical items to the students and has them listen to a short lecturette on the topic of leisure activities. Pitched at an intermediate level, the text presupposes a wide knowledge of sentence patterns and vocabulary. The questions which ensue measure listening comprehension rather than knowledge of language forms:

> Après une bonne soirée le samedi, on est naturellement fatigué. Pour être prêt à recommencer une semaine, il faut se reposer.... Pourquoi faut-il se reposer? - Il faut se reposer pour être prêt à recommencer la semaine..."[35]

The same is true of the Lectures Illustrees in Basic Conversational French, where the tape provides time for the student to answer each question he is posed and then suggests one acceptable reply to the question which can serve as a guide to the student to decide whether his own answer was right or wrong. Similar materials may be found in other French text-books, but it is unlikely that the authors intended the reading selections printed to be treated as exercises in listening comprehension[36]. We shall have to return to this matter in the chapter on Language Laboratories.

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[34] ibid., page 218. See excerpts at the end of this chapter.

[35] Binda: Intensive Spoken French, Book I, Washington, 2ed. (1962), pages 102-103.

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[36] Harris and Lévêque, NY, (1962), the illustrated section of the book. Hope: Spoken French in Review, NY, (1963), pages 3ff; Lenard: Parole et Pensée, NY, (1965), pages 30ff; Kneller, Grubbs, Barenbaum: Initiation au Français, NY, (1963), pages 178ff In this context, it is interesting to compare the procedure of Hines and Welch: Our Latin Heritage, Book II, NY, (1963), in the treatment of chapters from Caesar's De Bello Gallico, pages 321ff. Book 7 Chapters 5-49 are summarised in a page of English, Chapter 50 is printed with Comprehension questions appended, some in English, some in Latin.

Côté, Lévy, and O'Connor: Le Français: Ecouter et Parler, NY, Holt, Rinehart, and Winston, Teacher's Manual, (1962).

9. Les distractions page 213

1. Que je suis fatigué!
2. Alors, tu ne veux pas venir avec moi?
3. Ou veux-tu aller?
4. Chez Simone. Tout le monde sera la....

Question-Answer Practice. page 214

1. EDMOND Est-ce que tu veux aller chez Simone?
   GUSTAVE Je n'en ai pas envie.

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2. ANITA Tu ne veux pas venir avec moi chez Marie-Claude?
   YVETTE Non. Je suis fatigué....

Pattern-Practice page 215

1. Alors, tu ne veux pas venir . . avec moi/lui/elle/nous/eux/elles
   Alors, tu ne peux pas venir . . "
   Alors, tu peux venir . . "
   Alors, tu veux venir . . "
   Alors, tu ne veux pas aller ... "
   Alors, veux-tu aller " ...

Conversations. page 218

1 Alfred sees Jérôme hurrying home.

ALFRED Veux-tu venir chez Laurent avec moi?
JEROME Non, merci. Je suis très fatigué,
ALFRED Il a de nouveaux disques et je vais aller les écouter.
JEROME Je regrette, mais je n'ai pas envie d'écouter des disques aujourd'hui....

FACTUAL QUESTIONS: 1. Jérôme veut-il aller chez Laurent avec Alfred?
2. Pourquoi pas?
3. Pourquoi Alfred veut-il aller?
4. Pourquoi est-ce que Jérôme dit, "Je regrette"?...

PERSONAL QUESTIONS: 1. Avez-vous de nouveaux disques?
2. Avez-vous toujours envie d'écouter des disques?.....

Topics for Reports. page 224

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2

Mon ami nous attend chez lui.... Pourquoi nous attend-il?... Que peut-on faire chez lui?... A-t-il la télévision?... Aimerais-tu la regarder?... Qui sera la?... A quelle heure vas-tu rentrer?....

Panel 2

## V: MATHETICS AND THE LANGUAGE LABORATORY

5.0 Skinner's Verbal Chaining the basis of Mathetics

5.1 Gilbert's technology: comparison with linear programming

5.2 Prescription of objectives

5.3 Writing Mathetical Exercises

5.4 Mediation Theory and its Applications

5.0 Skinner's remarks about "chaining", Pressey's criticisms of small step linear programmes and Crowder's method of taking up each overt response at the beginning of the following frame are fused in Barlow's "Conversational Chaining". As a variant of linear programming, Barlow's approach cannot be considered a separate system, but it does lead us to a study of Gilbert's contribution: hence these introductory comments.

Barlow notes that some stimuli prompt responses which in turn become stimuli for later responses forming a chain. Normally in Skinner's linear programmes, responses emitted by the student are checked with an answer key. Where the response is identified with the stimulus of the succeeding frame or with part of it, Barlow considers that the answer key can be dispensed with[1]. Since Barlow agrees with Pressey[2] in reducing the number of minimal steps in linear programmes, he considers it feasible that when overt responses are required, students can check whether they are right or wrong by looking at the italicized word or words in the following frame. This style of programme is ideal for short sequences dealing with a single theme, but it runs into difficulties when lengthy constructed responses must be given, or a change of topic catered for[3].

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[1] "Conversational Chaining in Teaching Machine Programs", Psychological Reports, 7, (1960), page 188.

[2] "Some Perspectives and Major Problems Regarding 'Teaching Machines'", in Lumsdaine and Glaser (eds): Teaching Machines and Programmed Learning, Washington, (1960), page 497.

[3] Markle: Good Frames and Bad - a Grammar of Frame Writing, NY, (1964), page 169.

It has the advantage of being faster to work through than linear programmes and of lending itself to broadcast work in the languag laboratory. It provides the rationale for item substitutions and transformations where the response of one frame is the stimulus for the next[4] The consequent disappearance of answer keys is hailed as an advance by Gilbert[5]. To him the reinforcement factor no longer operates immediately after the response but simultaneously with it.

5.1 As a system, Gilbert's method involves both an acceptance of the main theories of Skinnerian behaviorism and the rejection of the main practices of Skinnerian programming[6]. Gilbert is an iconoclast. He reads the work of Ebbinghaus and rejects it as responsible for saddling later research with a hampering methodological bias[7]. He considers repetition, for example in paired-associate learning, to have aversive characteristics and thinks that research will eventually show that learning is facilitated when identical repetitions are replaced by attempt to focus the student's attention on the similarities and differences between items to be memorized[8]. Mathetics, as Gilbert calls his approach, cuts across the methodological variations which characterize linear and intrinsic programming, particularly the dispute whether constructed responses (supposedly requiring recall of knowledge) and multiple-choice options (supposedly involving recognition only) represent the most suitable format for teaching programmes. He considers the alleged reasons for preferring one approach to the other specious: they do not come to grips with student behaviour. What guarantee have experimenters that student attempts to find the right constructed response in a linear programme does not merely entail hunting through frames for clues to the word required? he asks. If the word is heavily prompted, in what sense is recall involved? On the other hand, the student who selects from multiple choice options may, as Crowder wishes, consciously decide upon one item rather than another, or he may simply guess wildly, he may scan the text for further clues as if completing a jig-saw puzzle or crossword, or he may choose his answer and compare it with the other alternatives - all the while reserving his judgment in the absence of more compelling evidence. Like Crowder and Pressey, Gilbert also quarrels with Skinner's principle of forcing all students to proceed by minimal steps on the grounds that this

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[4] Belasco, "Structural Drills and the Refinement Principle", in Gravit and Valdman (eds), Structural Drill and the Language Laboratory, Bloomington, (1963), pages 24-25. The technique is illustrated in the tape accompanying the text cited at the close of the preceding chapter (Côté et al.: Le Français, Ecouter et Parler, NY (1962) page 215.)

[5] "Mathetics, the Technology of Education", The Journal of Mathetics, I, (1962), page 19.

[6] ibid., pages 31-32

[7] "On the Relevance of Laboratory Investigation of Learning to Self-Instructional Programming", American Psychological Association, (1959), reprinted in the reference cited in note 2, page 475.

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8. "An Early Approximation to Principles of Programming Continuous Discourse", Bell Telephone Laboratories Report, (1958), abstracted in the reference cited in note 2, page 632. Asher in his "Evidence for 'Genuine' One-trial Learning", International Review of Applied Linguistics in Language Teaching, I, (1963), pages 98-99 shows how the experiments of Rock (1957, 1958, 1959), Estes (1960) and Bower (1962) support Gilbert.

induces boredom[9].

This is not to say that Gilbert does not depend heavily on Skinner. He does. From Skinner, he borrows the paradigm of operant conditioning of rats and pigeons and applies it like Skinner to human learning[10]. He does, however, call Skinner's equiparation of primary and secondary reinforcement an abandonment of common-sense[11]. For Gilbert, the only reinforcement which will condition human operants is one which directly satisfies human aspirations. Therefore only knowledge of results clearly associated with the student's desired goal is intrinsically reinforcing. This is guaranteed when the student works back from the known target through the behaviour chain. The reinforcement for the operant preceding the terminus of the chain is the final discriminative stimulus whose intrinsic value comes from direct association with the desired goal. Each preceding operant is reinforced in the same way[12]. When external reinforcement is deemed appropriate, it can be added, as Skinner recommends, in the form of teacher approval, parental concern and approbation, successful competition against peers, relationship to a future possible profession... Skinner spoke about behavioral chaining without exploiting its consequences; Gilbert criticizes Skinner for this omission and proceeds to found his

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[9] Reference in note 5, page 64.

[10] ibid., pages 7, 11, 15ff.

[11] ibid., page 13. Taber, Glaser and Schaeffer in Learning and Programmed Instruction, Reading, Massachusetts, (1965), pages 27-28 discuss the implications. H.F. and M.K. Harlow and Meyer "Learning Motivated by a Manipulation Drive", Journal of Experimental Psychology, 40(1950), 228-234, make the same point.

[12] Gilbert, op.cit., page 21.

Mathetics on backward chaining[13].

| SKINNERIAN (LINEAR) PROGRAMMES: | GILBERT'S (MATHETICAL) APPROACH |
|---|---|
| 1. Emitted operant (response) | 1. Emitted operant (response) |
| 2. This is to be overt. | 2. This may be overt or covert. |
| 3. Small steps. | 3. Steps as large as the student can manage. |
| 4. Immediate knowledge of results. | 4. Simultaneous knowledge of results. |
| 5. This is done by giving the right answer. | 5. Giving the right answer should be superfluous. |
| 6. Use of constructed responses. | 6. Use of whatever response the situation requires. |
| 7 Successive approximations to target. | 7. Backward chaining principle. |

Panel 3: Comparison of Skinner and Gilbert

Carroll follows Gilbert's analysis of chains of acts and the need to relate the terminal performance in each chain to sub-goals in each unit of work to be taught[14].

5.2 The first prescription of objectives as Gilbert envisaged it has been outlined for language skills in Chapter I of this thesis. Besides the purely linguistic features, the first prescription will also list the relevant details of a more general theory of perception or learning covering not only the specific subject-matter but all similar cases. This "realm" theory, as Gilbert styles it, might point out the difficulty experienced by beginning students of foreign languages in memorizing utterances longer than seven syllables[15]. This seemingly arbitary figure is in keeping with the experimental findings of Sister Barbara Loe who concluded English speakers with some knowledge of Chinese could retain 8.6 words without failure in Chinese and Chinese speakers with some knowledge of English could retain 9.8 words without failure in English[16]. As proficiency in language skills grows, it is to be expected that the student's memory span in the foreign language will likewise increase. Thus ideas about memory span can make an important contribution to the realm theory appropriate for any of the language skills. The realm theory could also involve psychological data on reaction time[17] when the particular language stimulus to be presented to students is expected to prompt a response other than mere understanding. The realm theory could also specify elements in the process which can be improved through training and those which the student simply cannot master. On the basis of analysis and systematization of the data compiled, a sufficiently refined prescription can be formulated on which the matheticist can estimate the student's operant span.

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[13] Skinner: Verbal Behavior, NY, (1957), page 73.

[14] "A Primer of Programmed Instruction in Foreign Language Teaching", International Review of Applied Linguistics in Language Teaching, I, (1963), pages 125 and 127.

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[15] Côté et al.: Le Français, Ecouter et Parler, NY, (1962), Teacher's Edition, page xxi.

[16] Immediate Memory Span in English and Chinese Sentences of Increasing Length, unpublished M.S. thesis at Georgetown University, (1964), cited by Lado in "Memory Span as A Factor in Second Language Learning", International Review of Applied Linguistics in Language Teaching, III, (1965), page 127.

[17] Lado, Language Teaching, A Scientific Approach, NY, (1964), pages 38ff.

The operant span is the maximal change in the direction of mastery made possible by one mathetical exercise[18]. If for example the task involved increasing the student's ability to understand spoken French, the linguistic theory of the first prescription would be analysed in the light of the psychological principles involved in listening comprehension and an estimate made of how much material would constitute a single step. Supposing the future forms of irregular French verbs were being taught, expressions of suitable length and content would be constructed to act as kernel sentences around which all the instruction would be centred. Expressions like "on ne sera pas surchargé" would be contrasted with patterns like "il y aura quelques heures de répit", each in its own way being likely to suffer some interference from the student's native language. Each new type of linguistic item whether comparable in structure and pattern to the equivalents in the student's native language or not is likely to constitute the subject-matter for the largest step feasible for a mathetical exercise. That the size of step is sure to be larger than what Skinner would tolerate is axiomatic in view of Gilbert's refusal to break up operants into small steps[18]. Identification of operants in the behaviour chain, estimates and systematizations form the nucleus of the second approximation to a synthetic repertory of the behaviour implied in mastery.

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[18] Gilbert, op.cit., page 25. Mc Gaulley, "Mathetics in Industrial and Vocational Training", abstract 29 of papers presented at the National Programmed Learning Conference, Loughborough, 1966, Programmed Learning, 3, (1966), page 115, stresses the same point.

At last a point is reached at which a theory uniquely designed to embrace all the relevant details can be formulated. This "domain" theory is analogous to the specifications of a building that architects are to design. Such specifications include mention of the peculiarities of the site and the views to be exploited, requirements concerning alignment and natural lighting, and the extent of foundations to take the weight of special structures at a later stage... So too, in what concerns the teaching of French, a matheticist will prescribe recognition vocabulary of definite content and size as a prerequisite for understanding successfully phrases which will occur in context in the lesson. It will not be enough evidently to state that the student will have to study definite syntactical features, such as are listed for study in handbooks for public examinations. Duplication of items can be eliminated by close scrutiny of their nature. Similarly, every different morphological feature will need to be provided for by the domain theory. The final product will resemble a syllabus following the general lines of Marty's Linguistics Applied to the Beginning French Course[19]. Gilbert is careful to point out that all theory prescribed must be functional; it must be seen in relation to the terminal behaviour envisaged in the objectives[20].

5.3 Once the basic planning is accomplished, the sequence of exercises necessary to mastering the domain theory can be elaborated and the actual writing begun. Gilbert is very clear about the need to fit the format of exercises to the particular requirements of the course, and for this reason mathetical exercises cannot always immediately be recognized as such from their layout or presentation[21]. Mathetics exercises are not restricted to a particular device or even to exclusive use of spoken or written words for they lend themselves to the inclusion of illustrations, tools and models to reach their goal Gilbert states categorically that if an instructor has no teaching machine, he is not to get one. "Don't buy one; don't borrow one; don't steal one. If you have such a gadget, get rid of it. Don't give it away, for someone else might use it." Whatever presentation device is used must not be allowed to control the material taught but rather the lesson must determine the teaching method. The teacher's aim is to find the best way of having the pupil achieve the education goal intended. Gilbert's advice is that exercises be developed for one individual and the resultant material field-tested on others. Only after a programme has been developed which actually works tolerably well can thought be given to the most appropriate way to automate the teaching process. The instructor's role then ceases to be expository and becomes diagnostic and remedial.

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[19] Roanoke, Virginia, (1963), pages 1-263

[20] op.cit., page 40.

Gilbert's backward chaining principle fits in with the widespread use of backward-build up in language laboratory training[22]. In this procedure, the audio source says:

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[21] Reference in note 2, page 475.

[22] Carroll, op.cit., page 127 recommends this technique and gives examples from the teaching of Mandarin Chinese.

"Ici" - which the student repeats. The source then continues: "L'intention de faire ici." (pause) 3 "Qu'avez-vous l'intention de faire ici?" (pause) giving the student ample time to repeat each of these utterances in turn. Backward build-up minimizes the danger that students pronounce the first two or three syllables accurately and mumble the rest, and if intelligently used, can help the student to see how few words are necessary to convey meaning in the context of a situation dialogue like the following:

4 "Discuter les idées au programme." (pause)
5 "Moi, j'espère discuter les idées au programme." (pause)
6 "Tout le temps?" (pause)
7 "Vous le ferez tout le temps?" (pause)
8 "Est-ce que vous le ferez tout le temps?" (pause)
9 "Il y aura des vins à discuter aussi." (pause)
10 "Ah! Eh bien, non, alors! Il y aura des vins à discuter aussi." (pause)

The student can notice that line 4 is a sufficient answer to line 3 and that some elements of line 5, though providing a fuller response, could be considered superfluous. Similarly line 6 with a rising intonation is an ample rejoinder to either lines 4 or 5, but lines 7 and 8 provide a listener with ever so many more clues to identifying the meaning conveyed[23]. The student builds up his longer utterances by beginning with the last in a series of sense-groups (line 6) and by gradually adding more and more introductory material (lines 7 and 8) by the process of backward build-up until he can use the whole sentence (line 8) as a rejoinder to the preceding sentence (line 5). A similar procedure can be adopted, where applicable, to drills designed to help the

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23. Cherry, On Human Communication, NY, (1957), pages 116 ff. discusses semantic and syntactic "redundancy" at some length.

student gain flexibility in manipulating the elements in the kernel sentences of the situation dialogue[24].

Work on the situation dialogue itself is probably best begun by allowing the student to hear the whole exchange and see the conversation as a whole as both Pressey and Gilbert recommend. The presentation of the dialogue subsequently in sense-groups can help considerably in ensuring that meaning is not lost while the various elements are repeated. Sometimes the very repetition of a phrase helps the student to grasp a meaning which previously eluded him; often the ability to recall sentences is linked with a growth of ability in listening comprehension. The further stage of being able to use the information remembered to answer a questionnaire is certainly evidence of increasing competence in understanding[25]. In order of difficulty, the writer suggests three different types of questionnaire which could be based on the portion of dialogue just quoted. Evidence of comprehension can be given by picking out an appropriate answer in a multiple-choice question given in English:

"Pourquoi vient-on ici?
a) to discuss all the time?
b) to enjoy oneself and gain knowledge?
c) to go to wine-tastings?
d) to visit Adelaide?"

The last is a donkey answer for people who understood little or nothing of the dialogue; the first and third answers are provided for those who understood an odd phrase or two in the dialogue and the second answer alone is complete. When the same alternatives are presented in a French which itself tests the student's ability to equiparate "s'amuser" and the activities described in the dialogue, the test appears somewhat more demanding, and could perhaps be employed when the student works through the material for a second time:

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[24] Belasco, *French, an Introduction to Applied Linguistics*, Boston, (1961), page xx.

[25] Rivers, "Listening Comprehension", *Modern Language Journal*, L, (1966), pages 196-204.

"Pourquoi vient-on ici? a) pour discuter tout le temps?
b) pour s'amuser et s'informer?
c) pour goûter des vins?
d) pour visiter Adelaide?"

A constructed response in which the answer is prompted to restrict very severely the possible variety of answers which could be given may prove still more demanding as a test of listening comprehension, provided that students are not given so much information as to turn the test into a sort of cross-word puzzle:

"Pourquoi vient-on ici? On vient pour s(e)....., et s(e)......
s'informer s'amuser"

Alternatively, the student may simply be asked the relevant question and after a suitable pause be asked to decide whether a particular answer given was right or wrong. Thus the student can be led to recognize the same ideas expressed in a more sophisticated form. The student could be asked to supply the idea missing in the following letter:

"Cher collègue,
Je suis venu à Adelaide pour participer à un congrès au sujet de l'enseignement de langues au laboratoire. Naturellement, on espère beaucoup discuter nos projets, mais il y aura également l'occasion de s'amuser un peu.
Ton Albertine."

Another exercise to test comprehension would be to use one of the original types of questionnaire outlined above after hearing the following:

> "L'importance des laboratoires de langues fournit beaucoup de matières à discussion. Pendant le congrès, il faudra critiquer une demi-douzaine de causeries, mais on ne sera pas surchargé. Il y aura, après tout, quelques heures de répit où on pourra s'amuser, goûter un peu les vins du pays et faire des promenades dans les environs."

Subsequent pattern-practice based on the dialogue and narratives would serve to drill the irregular future forms and serve to recapitulate and reinforce constructions involving the infinitive with or without a preposition:

> "Je suis venu à Adelaide pour participer à un congrès/
> vous/ils/nous...."

The student following the transformation drill could be asked to precede each utterance by "La semaine prochaine" or "Demain soir" in order to force him to use the appropriate future forms. In the formula:

> "Il y aura l'occasion de s'amuser un peu "

students could be asked to substitute expressions like "des vins", "quelques heures de répit", "le temps", "le nécessaire", making the necessary adjustments. As noted in Chapter I (paragraph 1.4), the interdependence of listening and speaking skills favours their being developed concurrently in such drills as these.

5.4 The essential contrast between Skinner's theory and Gilbert's centres around the role of the domain theory. To Skinner, the programmer uses this prescription of objectives to lead the student by successive approximations to overall competence in the skill being taught. Gilbert wants the theory to serve a mediational purpose[26]. The Mediation Hypothesis put forward by Woodworth[27] appears to reconcile Skinner's behaviorism and the type of "gestalt" outlook envisaged by Pressey[28]. As accepted by Gilbert, it consists of noting that some responses are tied to the stimulus-object and some are detachable; these detachable responses alone tend to be elicited in the presence of the sign or symbol of the stimulus-object. The mediating reactions elicit self-stimulation in the organism[29] and the "encoding" of overt responses - the expression of ideas[30]. The consequent short-circuiting involved in the mediating thought processes bypasses the need of reference to stimulus-objects and paradigms in speech[31] and supports the use of analogy to develop language skills in a student[32]. For Gilbert, then, mathetical exercises should focus attention on how analogy operates and use kernel sentences to short-circuit the mastering of syntactical patterns[33] To return to the situation dialogue previously

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26. reference in note 5, page 43.
27. "Reinforcement of perception", *American Journal of Psychology*, 60, (1947), pages 119-124
28. Osgood: *Method and Theory in Experimental Psychology*, NY, (1953), page 392. Pressey's view was outlined at the end of section 4.1 of Chapter IV.
29. *ibid*., pages 410-411, and Rivers: *The Psychologist and the Foreign Language Teacher*, Chicago, (1964), pages 134-135, 182-183.
30. Osgood, Suci and Tannenbaum: *The Measurement of Meaning*, Urbana, (1957), page 8.
31. Reference in note 28, pages 411 and 400 where the development of skills is discussed.
32. Brooks, *Language and Language Learning*, NY, (2ed. 1960), page 262, who quotes Langer; *An Introduction to Symbolic Logic*, NY, (1953), page 33 on the same point.
33. *op.cit*., page 49.

presented, the possible sources of interference between French and English, for example in the case of "il sera" and "il y aura", should first be eliminated by instruction, and then the two patterns taught by analogy as demonstrated in the examples above[34] The establishing of sentence patterns in a student's foreign language repertoire usually takes longer than the dozen or so examples which some text-book writers appear to think adequate, but not all practice of a pattern should be massed in one block lest the student get bored. It is far more efficient to encourage retention, as Carroll does[35], by reintroducing examples from time to time in cyclic recurrence to ensure that relevant theory is not forgotten. Further discussion of the application of this technique to Language Laboratory Programming appears in Chapter VII.

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34. See Stack, The Language Laboratory and Modern Language Teaching, NY, (1960), pages 32ff.

35. Programmed Self-Instruction in Mandarin Chinese: Observations of student progress with an automated audio-visual instructional device, Wellesley, Massachusetts, (1963), abstracted in ML Abstracts number 554, reprinted in Nostrand et al, Research in Language Teaching, Seattle, (2ed 1965), page 60.

# CHAPTER VI IDIOMORPHIC PROGRAMMING

6.0 Extrinsic factors accommodated

6.1 Computer-based instruction

6.0 Crowder notes that there are two ways in which "branching" can be introduced into a teaching programme: "intrinsic" where there is a one-to-one correlation between the student's response and the next material he sees[1], and "extrinsic" when other factors are taken into consideration in the selection of what the student would benefit from studying next[2].

Lewis points out that there is an optimum level of difficulty in programmed materials below which the student becomes bored, above which the student feels unable to cope[3]. When a counter within the presentation device records the number of errors the student is making in a test situation[4], this information can be used to calculate which of the less difficult branches of the programme should be presented to keep up the student's motivation and ensure satisfactory performance[5]. The computer, or the part of it which may be used for controlling the presentation device, can record and utilise where relevant the student's estimated aptitude, past performances, academic and family background - in fact, any data relevant to the educational process. The computer can also print out any information concerning the progress of any particular student which a teacher may wish to learn.

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[1] "Simple ways to use the Student Response for Program Control", presented at the Conference on Application of Digital Computers to Automated Instruction, October 10-12, 1961, Washington, page 2, column b. (printed by U.S. Industries, Inc., NY.) This method is discussed at length in chapter 3.

[2] Richmond : *Teachers and Machines*, London, (1965), page 64.

[3] "The Rationale of Adaptive Teaching Machines", in Goldsmith (ed), *Mechanisation in the Classroom*, London, (1963), page 100.

[4] cf Pressey's "A Simple Apparatus Which Gives Tests and Scores - and Teaches", *School and Society*, 23, (1926), reprinted in Lumsdaine and Glaser (eds): *Teaching Machines and Programmed Learning*, Washington, (1960), page 40.

[5] Coulson, Bushnell and Cogswell: "Computer-Based Instructional Systems", in *Applied Programed Instruction*, Margulies and Eigen (eds), NY, (1962), page 107.

3.1 The System Development Corporation began using a Bendix G-15 computer early in 1960 to train individual students. The computer selects from a 600 frame random access projector material suited to the individual's needs. The student types his responses onto an electric typewriter and the computer takes over to answer "right" or "wrong" before presenting the next frame. Both the pace of presentation and the level of difficulty can be governed by the cumulative record of the student's progress generated within the computer's storage[6].

"Mentor" built by the Thompson Ramo Wooldridge Company uses a motion-picture film and slide projectors, written and aural verbal sources, control units in the form of student response panels, and a computing section which adapts the presentation of materials to the student's performance[7].

"Socrates" was designed by Stolurow and Davis to automate the tutorial process, emphasising such features as adaptability, dependence on the student's response, and changing the programme during the course of instruction[8]. Extrinsic

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6. ibid., pages 109-111.
7. Finn, "Technological Development: Its Meaning for Education in the 1970's", in Filep (ed): Prospectives in Programing, NY, (1963), page 199.
8. "A Model and Cybernetic System for Research on the Teaching-Learning Process", Stolurow in Programmed Learning, 2. (1965), page 142.

information to the programme is first fed into the computer by the teacher to allow it to determine a sequence suitable for the individual student. Then the computer monitors the student's performance in what is called its Professor function. This makes possible alterations in the programme on the basis of the student's performance, e.g. his pronunciation of foreign language sounds[9]. The computer continues to employ its teaching function until such time as routine testing ceases to indicate that instruction was effective and a search through the computer storage reveals that no more satisfactory strategy or course content can be found for further presentation of materials. The concept of "idiomorphic" programming as described by Stolurow for the Socrates project does not appear to be intrinsically different from that outlined by Pask and Lewis[10] for the development of communication skills.

The University of Illinois uses a computer with a television display and a typewriter keyboard for each student in its Plato project[11]. The student types his answers to the tests appearing on the television screen and asks the computer to "judge" his performance. He finds out whether he is correct, and in the event of being wrong and unable to see why, the student can press the "help" button, which branches him to appropriate remedial material. As soon as the student following this new sequence understands the point being made, he may return himself to the original instructional sequence developed for him in the first instance.

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[9] ibid., page 147

[10] "The Development of Communication Skills under Adaptively Controlled Conditions", Programmed Learning, I, (1964), page 84.

[11] reference in note 7, pages 200-201.

Other computer-based systems of instruction have been devised, but the University of Sheffield has introduced a feature which is unique[12]. Their programmes are basically linear in approach, but the great flexibility of the computer makes it possible to use any of twenty different constructed responses to a given frame as the point of departure for a branch in the programme.

Given the experimental nature of attempts to use a computer to control adaptive teaching machines, it seems premature to theorize about their introduction into language laboratories. When one is used, it is unlikely that it will alter fundamentally the various presentation techniques discussed in the next chapter.

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12. Sime, "The Elements of the Teaching System" in

    Goldsmith: Mechanisation in the Classroom, London, (1963), pages 113-135.
    Annett: "Teaching Machines in Industrial and Military Training", in Austwick (ed): Teaching Machines and Programming, Oxford, (1964), pages 43-78.

## CHAPTER VII: PROGRAMMING FOR THE LANGUAGE LABORATORY

7.0 What is referred to as 'audio' programming

7.1 Ways in which a language laboratory can make a unique contribution

7.2 Styles of programming best adapted to "broadcast" systems

7.3 Styles of programming best adapted to "library" systems

7.4 Resume of principles for evaluating language laboratory programmes

7.0 Only a small proportion of programmes developed for instructional purposes have depended on an "audio" source. Some have been developed for industrial and commercial training[1]; a number have arisen from a wish to make lectures and tutorials more efficient[2]; the majority are for language teaching.

7 1 In the ordinary classroom, the recognition of the phonemes of a foreign language is complicated by slight variations in pronunciation on the part of the teacher and eventual distortion through fatigue or emotional factors. The language laboratory can provide an unvarying model, often enough one with a more authentic foreign language accent than the teacher's. The audio source is able to present a patient and pleasant model as frequently as the student wishes to use it, with or without the personal supervision of a monitor. Carefully prepared, the tape can include as much or as little of live discussions, lecture expositions and dramatised readings as the editor sees fit to include for student use. The unbroken sequences in a taped lesson can be adjusted in length to the mean span of attention of the student who is to use it. Besides providing opportunity for the recognition and comprehension of what is heard from the audio source, the language laboratory lends itself to the improvement of standards of pronunciation among the students even if it does not ensure that they will"speak like natives"[3].

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1. Shearer: "A New Look at Audio Programming", Programmed Instruction Bulletin, I, (1966), number 2, page 16.
2. Connor: "The Two Faces of Programmed Instruction", The Teachers' Journal, 48, (1965), page 451.
3. Mueller and Niedzielski: "Programmed Instruction in Teacher Retraining (NDEA Institutes)" Modern Language Journal, L, (1966), page 94.

To give practice in other speaking skills, students can be taught to play roles in situational dialogues[4] and by manipulating phrases derived from these gain considerable flexibility in handling the target language creatively[5]. Reading comprehension can be improved at a rate and with a variety of materials not possible outside the language laboratory and the writer devotes Chapter IX to the particular case of the study of literature The language laboratory reproduces exactly the situation in which much instantaneous translation is now carried out in conferences; the only difference is the teaching provided by a programmed audio source. For written translation and the skills involved in writing from dictation and in free composition, the language laboratory can make a certain limited contribution.

7.2 In "broadcast" systems, a major factor in the improvement of many skills, including the ability to take dictation accurately, is the unvarying model and the calculated pacing provided by the audio source. The measure of recognition and recall involved in "spot" dictation[6] makes it possible to create adjunctive programmes of this nature very readily. Given prior instruction in the language features to be tested by dictation, the student in the language laboratory can focus his attention on the particular structures or words which the teacher wishes to drill. When the student checks his constructed response against his answer key or learns which of the multiple choice options is correct in the context, he is reinforced positively or negatively to the extent that Skinnerian theory on this subject is valid When the teacher's purpose is diagnostic, a conventional dictation is more appropriate and analysis of the errors made reveals student weaknesses.

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[4] Sourly caricatured in O'Neal's: "My Aunt's Pen", Modern Language Journal, 47, (1963), pages 29-30

[5] Mathieu: "One Answer to Advanced Lab Work", Modern Language Journal, 44, (1960), page 354

[6] See Chapter I, Section 1.8 of this thesis.

From the outset, adjunctive programmes appear particularly suited in the "broadcast" laboratory for training in listening comprehension. If exposure to continuous speech or dialogue is to be advantageous to the student, it appears that some preliminary resume, paraphrase or questionnaire can only facilitate comprehension by focussing the student's attention on the major points to be made in what he is about to hear. It may be that the student is not sufficiently proficient to do more than understand sentence by sentence what the speaker is talking about, but if he is able to recall anything at all through the use of immediate memory, an occasional rhetorical question may elicit at least a covert response during the pause before the appropriate reply is supplied Where recall is possible at the conclusion of the listening phase, students can be asked to answer in their own words or in phrases they can remember from what they heard a series of questions testing comprehension. The students should realize that the answers they will hear after their own attempted responses can only be one satisfactory reply, and not necessarily the best or only one for the circumstances. To ensure that students can participate in conversation and are not trained merely in a type of transformation drill based on the question heard, they can be encouraged to use short, everyday, conversational replies without being given much time to ponder. For example, to revert to the dialogue composed for chapter V, the student can be asked: "Qu'allez-vous faire ici?" and be expected to reply something like: "Discuter les idées au programme" or "M'amuser et m'informer" or "Je vais parler avec les participants". None of the answers can be really excluded, though the latter two could indicate greater flexibility than the first. If the student is fairly proficient, he may be asked to summarize what he heard in his own words and allowed to compare his summary with the spoken or written summary of the programmer. The more competent the student, the less likely it is that anyone could predict the formulas he would use to express his thought.

Wikstrom refers to the use of linear techniques in improving listening on the part of managers and salesmen[7]. When the student is in control of the audio source, there can be no doubt about the theoretical feasibility of such an approach. Does it matter that in a broadcast system the student would have to work at the speed determined by the tape-recorder? Studies by Gropper and Lumsdaine with 148 junior high students seem to indicate that the less gifted student suffers if forced to work at a pace beyond his capabilities[8]. Frye found that 44 pupils

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7. "Lessons in Listening", The Conference Board Record, II, (1965), pages 17-19.
8. "An Experimental Comparison of a Conventional TV Lesson with a Programed TV Lesson Requiring Active Student Response. Studies in Televised Instruction, Report no 2." Pittsburgh (1961), - abstract given in Schramm: The Research on Programmed Instruction, Washington, (1964), page 56.

of the same age-group were only ill affected by machine pacing if bright and dull students were members of the same group, not otherwise[9]. It seems, therefore, that even for the broadcast mode of instruction, a linear audio programme can be used effectively in the language laboratory[10]. In the teaching of 24 University French students, the writer found that the adaptation of a linear programme sequence intended for self-instruction to a form that made it possible to use it on a broadcast system was effective in teaching the recognition, production and phonetic transcription of French utterances, as evidenced by the students' written work while the programme was administered[11].

Mathetical exercises would appear to have certain advantages over linear programmes when presented aurally. Firstly, they are briefer and involve a clear statement of objectives to be attained right at the start. As mentioned in connection with adjunctive programming, this is an immediate advantage and helps the student to grasp the total meaning of what he hears. Pennington and Slack point out that mathetical exercises are determined by the stimulus-response analysis of subject matter and the exercise of the particular form of behaviour that is to be taught[12] When it comes to teaching discrimination in the recognition and production of French phonemes, it appears that the mathetical approach has a directness not found in linear programmes. The student, for instance, is to be taught to differentiate between "un bonbon", "un bon banc", and "un bon son", "un bon sang"; he is told the nature of the task: to discriminate between ɔ̃ and ɑ̃ and given exercises which help him to recognize and then to produce the difference.

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[9] "Group vs Individual Pacing in Programed Instruction", abstracted ibid., page 45

[10] Studies by Briggs: "Self-pacing versus Automatic Pacing in Paired-Associate Learning", in Lumsdaine (ed), Student Response in Programed Instruction, Washington, (1961), pages 399-410, with 77 airmen and Feldhusen and Birt: "A Study of Nine Methods of Presentation of Programed Learning Material", Journal of Educational Research, 55, (1962), pages 461-466 with 270 college students appear to support this conclusion.

[11] For the text in question, see the sequence on liaison at the end of Chapter VIII.

Eg.: "You will hear pairs of syllables. State whether the vowels are the same or different: bon bon ; bon banc ; mon banc ; Mont Blanc ; mon Mont ; son son ; son sang ; bon sang .

Both these nasal vowels are pronounced with the same tongue, lip and teeth position as for vowels you can already produce: the French /ɔ/ of "eau" and the English /ɒ/ of "hot". Imitate the sounds you hear: seau son ; son seau ; beau Mont ; haut Mont ;
hot an ; slot sang; blot banc ; cot chant .

In each of the preceding examples, what spelling gave the nasalized /ɔ̃/? What spelling gave the nasalized /ɑ̃/? 1. on, an

In each of the following examples, what spelling is pronounced /ɔ̃/? le conte et la comtesse comptent leurs crampons et leurs jambons Which spelling was pronounced /ɑ̃/? 1. om, on.
2. am

Notice that because of the nature of mathetical exercises, keys if given are not really necessary. The student knows that he is right as he goes along. The teaching of generalizations can follow a similar pattern and like the question-answer drills spoken of above can be written by any instructor. The essential detail is that the information conveyed to the student be accurate.

Depending on the nature of the student activity and the type of programme adopted, broadcast language laboratories can be supervised by a monitor or left unmonitored. The nature of the learning experience differs for the student in each case[13]. Working with 24 German II University students, Bauer found that monitoring in broadcast laboratories created better motivation, attendance, concentration and efficiency than in unmonitored groups. Because of this there was little surprise that monitored students performed significantly better on all post-tests than did unmonitored students[14]. The language laboratory is generally used for one of many learning situations, preferably closely integrated; in the laboratory students drill materials previously introduced in the classroom or lecture hall[15]. Often, because programmes are monitored in the laboratory, they do not need to be as comprehensive in content as self-instruction programmes designed for "library" use[16] Where lack of staff may, as Gaarder suggests, require the laboratory to be unsupervised[17], but Bauer adds that more work must be put into designing the language programme to achieve results comparable to those in monitored laboratories.[14]

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[12] "The Mathetical Design of Effective Lessons", in Margulies and Eigen (eds): Applied Programed Instruction, NY, (1962), page 302.

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[13] Mueller: "Experimentation and Research in the Development of Modern Foreign Language Materials and Teaching Methods" in Najam (ed): *Materials and Techniques for the Language Laboratory, International Journal of American Linguistics*, 21, (1962), part II, page 100.

[14] Bauer: "A Study of the Effectiveness of Two Language Laboratory Conditions in the Teaching of Second Year German", *International Review of Applied Linguistics in Language Teaching*, II, (1964), page 109.

[15] Stack: *The Language Laboratory and Modern Language Teaching*, NY, (1960), page 48.

[16] Forster and Sapon: "An Application of Recent Developments in Psychology to the Teaching of German", *Harvard Educational Review*, 28, (1958), reprinted in Lumsdaine and Glaser (eds): *Teaching Machines and Programmed Learning*, Washington, (1960), page 180.

[17] "Language Laboratory Techniques: the Teacher and the Language Laboratory", in Oinas (ed): *Language Teaching Today* in *International Journal of American Linguistics*, 26, (1960), page 47.

Programmed instruction as the essential ingredient of the learning situation under discussion need not exploit all the facilities available in any particular language laboratory, any more than it need be circumscribed by the physical limitations of a particular installation. The remedy for such limitations is simple: if a film-strip projector not normally available is required for a certain occasion, the administration is notified of the equipment needed. No style of programming is of itself demanded or excluded by the physical capabilities of the equipment installed with the obvious exception that a branching programme suited to each student's individual needs requires the appropriate equipment to be available in each student's booth. Given a computer like the one at Sheffield University, the multiplicity of possible answers to a stimulus question which can be presented simultaneously makes it somewhat less important to differentiate between programmes dependent on constructed responses and those using multiple-choice options[18]. The many possibilities could cater for any anticipated constructed response or a superabundance of multiple-choice options and still provide all the advantages of adaptive (extrinsic) programming. However, once again the highly individualized and costly approach is a practical possibility only with "library" type installations as defined in the introductory chapter.

Whatever the approach to programmed instruction, visual stimuli can be used to provide paralinguistic information through slide and film[19]. Illustrative material can help to create atmosphere for situation dialogues and pattern drills dependent on them or even to bring a literary work to life. It seems logical enough that conventional tape recorders will eventually be superseded when commercially practicable by videotape machines capable of similar versatility[20]. Schematic representations and diagrams, photographs and film are a definite help to instruction and no less valuable when they appear on the television screen of the language laboratory unit[21]. The matter at issue is to avoid putting the cart before the horse. Programmes must not be tailored merely to suit existing installations but language laboratories must be equipped to present materials simultaneously from as many sources as are required.

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[18] Sime, "The Elements of a Teaching System", in Austwick (ed): Teaching Machines and Programming, Oxford, (1964), pages 113-135

7.3 "Library" type laboratories can use whatever materials are programmed for the broadcast mode and others besides Their purpose is to allow students, to record their own voices for later self-evaluation. Tapes for such installations lose their value if excessively long, because students need to be able to listen to their performances critically and if necessary to re-record One type of installation allows students to participate in five phase drills where they can hear a model, imitate it, hear the model a second time and compare it with their own performance which is immediately played back to them in the fourth phase, and finally to hear the model again[22]. This type of equipment is used at the RAAF School of Languages at Point Cook for some types of drills. Less refined is the presentation device using tape loops of some minutes' duration. This allows the student to participate in short exchanges of dialogue or drill before hearing the replay and continuing on with the cource material. Bell and Howell have developed a presentation device in which the loop is replaced with a tape stuck onto a card which also carries printed instructions and where relevant the text to be heard. The student first records his voice in the space on the card-tape, then replays it. Where banks of tape-recorders present programmes continuously throughout the day, the student at his booth can switch in to the appropriate lesson channel at any time and use such recording mechanisms as are in his immediate control to participate in the lesson in the way that suits him best. Such remote-control installations are initially costly to install but have the compensations that noise-level is much reduced within the laboratory and maintenance problems and costs are lessened. The possibility of using in such remote-control installations a stack of loop cartridges such as are used by radio stations for pre-recorded advertisements suggests itself; the student could record on one loop in the stack and control playback on the half-dozen loops which contain material appropriate

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[19] Rosselot: "Audio-aids Techniques in Foreign Language Teaching", Modern Language Journal, 33, (1949), page 545.

[20] Borglum: "What is the A-V score now?", in Oinas (ed): Language Teaching Today, in International Journal of American Linguistics, 26. (1960), part II, page 202.

[21] Brown, Lewis, Harcleroad: AV Instruction: Materials and Methods, NY, (1959, 2ed. 1964), page 220.

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22. Lamérand: "Efficient Language Learning", a paper on intensive courses of instruction with particular reference to the R.A.A.F. School of Languages at Point Cook which has been submitted for publication.

to his stage of development. For the audio presentation of intrinsic programmes, the visual use of the tape-recorder counter does not make it possible to identify appropriate material quickly enough to be effective. However, two devices have been developed which slightly modify conventional tape-recorders and which do make true branching programmes available to the student Tape-recorders with two sets of heads, like the Point Cook remote-controlled equipment described above, can read any of four channels of a stereo tape-recording as required. Metal strips or studs can be coded onto appropriate positions on the tape to allow the machine to sense what part of the tape is appropriate to the student who has chosen any of up to four multiple choice options as the most suitable answer to the test question he heard[23]. Appropriate material can be coded by tones recorded on the tape which are outside the range heard by the human ear. These tones can be sensed electronically by the machine equally as easily as metal strips and with less wear and tear on the heads[24]. The extremely flexible multi-source presentation device, the Empirical Tutor[25], is capable of presenting a reading of Duhamel's Chronique des Pasquier with appropriate film shown simultaneously and of following it up with a programme of the following nature:

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[23] Barrutia: "A Suggested Automated Branch Program for Foreign Languages", Hispania, 47, (1964), page 344.

[24] Krones, Sawyer and Grosjean: "On the Use of Low-Frequency Tones for Marking Language Laboratory Tapes", Language Learning, 14, (1964), pages 51-54.

[25] Thomas, Davies, Openshaw and Bird: Programmed Learning in Perspective, Barking, Essex, (1963), page 25 - illustrated in frontispiece.

"74. . .Il y avait eu maint pourparler mysterieux - Qu'est-ce que
cela veut dire? a) qu'il avait recu beaucoup d'argent? (91)
b) qu'il était espion? (14)
c) qu'il avait fait beaucoup de
négociations? (78)

The frame would, of course, follow on from a previous multiple-choice question and would contain introductory sentences to tell the student his previous answer was correct and why. In this example if the student chose 91, he would hear:

"91: "Vous avez choisi la première réponse. Ne confondez pas pourboire et pourparler. Pourboire en effet implique de l'argent, mais pourparler exigerait au contraire des discussions. S'agit-il a) d'un espion? (6)
b) d'un homme d'affaires? (53)"[26].

While reserving to chapter 9 further discussion of the place of literary studies in the language laboratory, the writer takes the opportunity of stressing here the feasibility of using intrinsic programming for self-instruction in literature on the library system.

With the accent on self-instruction, linear programmes can be made to accommodate individual differences by the provision of skip steps. Discrimination training in the recognition and production of the phonemes of the target language seems to be at its best when students are able to spend as much or as little time as they need to master the point being taught[27]. Bauer found that students working with their own tape-recorders made significantly greater improvements in taking dictations than when paced in a group[28].

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[26] Lamérand: "The Language Laboratory and the Study of Literature", Babel NS, 2, (1966), pages 23-4.

[27] Carroll: "A Primer of Programmed Instruction in Foreign Language Teaching", International Review of Applied Linguistics in Language Teaching, I, (1963), page 135.

[28] Reference in note 14, page 111.

The only advantage student self-pacing provides when the student is taking dictations is the opportunity to listen again and again to utterances which are hard to transcribe and afterwards to revise the material. Under these circumstances better performances might in part be explained by the amount of extra time the individual student devoted to cultivating his skill by contrast with his counterpart in a group situation. In all dictation, however, as in all situations where comprehension is required, it is more beneficial to spend one's time in the laboratory understanding all or most of what is presented at the cost of repetition when necessary rather than failing to understand satisfactorily a single long recorded production[29].

Marty makes the important point that in the unmonitored library system language laboratory, students sometimes fail to identify aspects of their work which may be unsatisfactory.[30] His remedy is to include in linear programmes for self-instruction introductory frames aimed at developing discrimination in the areas where errors are likely to be made. To obviate the danger of spelling similar French and English words alike, Marty suggests that students be made to notice dissimilarities:

126 "Supply the missing letters: Il re,,emble à Pierre." -ss[31].
A similar technique may be readily devised for pronunciation problems. The possibility of building in an occasional source

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[29] Stack, reference in note 15, page 34.

[30] Programing a Basic Foreign Language Course: Prospects for Self-Instruction, Vermont, (1962), page 17.

[31] ibid., page 18.

of error to focus student attention on differences is a mathetical technique that warrants consideration[32].

At no stage should any programming technique become an end in itself. Drills which do not lead to the independent use of language for which they are designed have no place in a teaching programme. Every device is to be judged in terms of the extent to which it contributes to improved performance in a language skill. This means that where situational dialogues can help with improving listening comprehension and the pronunciation of stereotyped responses to commonplace stimuli, they need not all be committed to memory for their own sake. Where acting a role in a dialogue from which one of the participant's voices has been removed can simulate conversation from certain points of view, it may be that the same technique could be more profitably used for the insertion of replies of the student's own devising.

"L'EMPLOYÉ: Comment vous appelez-vous, monsieur? ------
Quelle est votre nationalité?
Où êtes-vous né?
Quel âge avez-vous?
Quelle est votre profession?
Où demeurez-vous?
Quelle est votre adresse à Paris?
Où habitent vos parents?
Avez-vous des parents en France? "[33]

When the student makes a reply appropriate to his own circumstances, he may not necessarily be able to diagnose all the errors he may have made but may get very desirable practice at improving the fluency of his replies. For any of a score of situations the student may be asked to respond to utterances like:

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[32] Reference in note 12, page 302.

[33] Harris and Lévêque: *Basic Conversational French*, NY, (3ed 1964), page 21

"MADAME X: Qu'il fait beau aujourd'hui! ------
Aimez-vous le soleil?
Que faites-vous d'habitude par un temps pareil?
Que pensez-vous faire maintenant?
Et après?
Puis-je vous offrir une tasse de café?
Vous prenez du lait et du sucre?"

Participation in such dialogues can be quite rewarding especially when monitored.

Illson makes the valuable suggestion that students be allowed to hear a short passage and asked to reproduce its content orally, using phrases remembered from the original[34]. As he points out, this test of listening comprehension gives students an opportunity to compose a spoken or written paraphrase where the content is sufficiently controlled to eliminate gross errors and the stimulus so difficult to memorize in its entirety as to demand some originality on the part of the student. Basically this foreshadows the principles outlined by Thompson for the introduction of writing skills into an audio-lingual modern foreign language program[35]. Only the early stages of development of writing skills appear to be favoured by the use of a language laboratory programme, though many students have learnt by experience just how challenging it is to try and take down the words of songs heard only over one's tape-recorder.

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34. "The Dicto-Comp: A Specialized Technique for Controlling Speech and Writing in Language Learning", Language Learning, 12, (1963), pages 299-301.

35. "Writing in an Audio-lingual Modern Foreign Language Program", in Teacher's Notebook, NY, (Spring 1965), abstract 913 in Modern Language Abstracts.

7.4 Language laboratory programmes, then, must be evaluated strictly in terms of their efficacy in realising the objectives they set out to teach. Programmes fail to serve their purpose to the extent that they fail to make the student independent of them after due study. Programmes for total self-instruction must first train the student to be sufficiently discriminating to use them effectively as they are worse than useless if they inculcate or promote error.

Step-size in linear, branching and adaptive programmes needs to be appropriate to the students for whom frames are written. Enrichment frames designed to challenge the gifted learner will tend to be rather more demanding than those in the main stream of the programme. Remedial frames or those skipped by talented students will fail to achieve their purpose if excessively difficult In general, the larger the step-size the more likely it will be that programmer and student disagree on the most suitable response When this gives rise not to frustration but to informed dissent this procedure can be an advantage. As Gilbert remarks, there is no need to disregard the superior student whose achievement scores in learning experiments are above average[36]. Programmes which do not cater for the gifted or the handicapped student will to that extent be less useful. However, memory span is a factor that must be provided for in most language laboratory situations and programmes which disregard experimental findings concerning it are likely to be inefficient especially in group presentation[37].

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[36] "On the Relevance of Laboratory Investigation of Learning to Self-Instructional Programming", (1959), reprinted in Lumsdaine and Glaser (eds): Teaching Machines and Programmed Learning, Washington, (1960), page 483.

Where programmes for broadcast laboratories are frequently designed to drill particular language structures previously taught in class or refine standards of discrimination after preliminary training in the recognition and production of phonemes, those for library use must contain a comprehensive coverage of all relevant material. Such programmes, as indeed those intended to comprise a basic course of instruction in a target language, must depend on an exhaustive analysis of the phonology, morphology, and syntax of the language to ensure that potential sources of error are eliminated[38]. Not only must the programme teach efficiently as shown in field-testing, but as Bung insists, every effort must be made to ensure that it does not teach falsehood[39].

Programmed instruction is an exercise in communication. Obscurantism and unnecessary complexity in expression must be avoided[40]. Clarity of exposition and a deliberate effort to focus student attention on the main points at issue are aided when such responses as are elicited concern matters of some consequence and not insignificant detail of little relevance to the main theme. While prompting is an issue connected with step-size, the skill with which it is faded and retention is encouraged can be evaluated under the heading of effective communication. As with all language laboratory tapes, so too with programmed ones, diction, phrasing, modulation, pause and the use of stress and variation in speed play an important role in sustaining attention. Indeed, for most language teaching, frequent changes from male to female voices, from more youthful to more mature voices are helpful in dissociating timbre from phonemic and intonational qualities. Tired or angry voices readily aggravate and fail to stimulate the student in the way that a friendly quality does. A programme which encourages attention and sustains thought is to be preferred to one which draws attention to gimickry or engenders boredom.

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[37] Lado: "Memory Span as a Factor in Second Language Learning", International Review of Applied Linguistics in Language Learning, III, (1965), page 129.

[38] Marty, reference in note 30, pages 1-3 and 9, and his more detailed Linguistics Applied to the Beginning French Course, Roanoke, Virginia, (1963), page vi.

[39] Subvalidation of Language Programmes mimeo, (1965), page 1.

[40] Crowder: "Intrinsic Programing: Facts, Fallacies and Future", in Filep (ed): Prospectives in Programing, NY, (1963), page 104.

Discussion of a programme is not complete without an examination of the achievement tests associated with its use. Care must be taken to check whether the tests actually evaluate what was taught. While field-testing can assist in identifying the strengths and weaknesses of individual programmes, material written to teach skills associated with real-life situations, as for instance instantaneous translation, is unlikely to be effective if the situation is simulated neither during the programme nor in the testing phase. Again if tests are such that students score less than some 90% of total marks available, something is wrong with the programme, the tests or both; a test after all measures the efficiency of the teaching device in a particular case.

## CHAPTER VIII: A PROGRAMMED COURSE IN FRENCH PHONETICS

8.0 Introduction

8.1 Objectives as gleaned from introduction and part of the text

8.2 Scrutiny of accuracy of content and efficiency of teaching

8.3 The format and how the programme is to be used

8.4 The teaching model adopted

8.5 Suggested improvements

8.0 From preceding chapters, the main characteristics of a programme are seen as the objectives it sets out to attain, the way in which it is to be used, the teaching model adopted, and the success with which the programmer communicates his information to the student.

8.1 Burroughs Programmed Course in French Phonetics[1] does not give details of the objectives envisaged. The title suggests that an attempt will be made to make an analytical study of the field perhaps with the practical purpose in mind that the student will be able to transcribe the French he hears into phonetic script. Another possible objective is to have the student transcribe written French into phonetic script. Again, it is theoretically possible that the programme designed to achieve the second alternative in fact teaches only the first. Given the total lack of extrinsic evidence as to objectives, a study of the text of the programme itself can alone equip the reader to decide what objectives Burroughs had in mind.

The Introduction claims that the programme sets out to teach:

1. A brief introduction to the linguistic approach
2. The French vowel sounds (oral and nasal sounds, semi-vowels)
3. The French consonant sounds
4. French orthography, including irregular spellings
5. Liaisons and elisions
6. Loss of /ə/ in rapid speech
7. Double Consonant sounds
8. French stress and syllabication 1.

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[1] Published in 1961 by Encyclopaedia Britannica, Chicago, as the first in their Temac series of programmes. (See Introduction)

Perusal of this list gives no indication of how the information communicated could be tested because the programme does not specify objectives in behavioral terms[2].

No achievement tests are printed in the programme. The teacher can only gauge how much the book sets out to teach by looking at what is actually presented. From the middle of the programme content list, we could select "Liaison", study the content and how the student is expected to perform. In the programme, this material is taught between frames 957 and 976, starting on page 160[3]. The section presupposes all the previous instruction on French phonemes.

When a phonetics programme teaches how to deal with liaison, the reader could anticipate that it would teach a number of things. He would expect it to enable him to recognize such liaisons as are made and how to indicate them in phonetic script. He might expect to learn when liaison is used in reading a French text aloud, how much is necessary, how much is permissible and how much is forbidden in ordinary conversation, in careful "educated" speech, in delivering lectures and in reading poetry. He might even hope to glean some factual information on the origin of the phenomenon. How much the programme actually achieves requires inspection.

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[2] Mager: Preparing Objectives for Programmed Instruction, Palo Alto, (1961), rp. as Preparing Instructional Objectives, Palo Alto, (1962), page 1.

[3] See the selection reprinted from the programme appended to this chapter

Delattre recommends in the teaching of beginners that instruction be confined to inculcating the principle:

> "liaison is made to the extent that usage has established close links between two words or classes of words".[4]

Burroughs' opening frame of the series adopts the same approach:

> 957..."There is no liaison where there is a punctuation mark, or a possible breath pause. There is a liaison between words which are never separated, and we must consider the syntax or placement of words in an utterance in order to determine whether or not a liaison is to be made".

But whereas Delattre has spent some time explaining what he calls "divisions de la chaine parlée"[5], Burroughs speaks of a "possible breath pause". If the programme depends on prior instruction on rhythmic or phonic groups, as given in Delattre's text, no user can quarrel with it for omitting further elucidation of what is involved. Again, if it is intended that a monitor versed in phonetics should always be available to the students who run into difficulties with the programme, we could expect a Teacher's Handbook to point out that some basic information is missing from the text and must be provided by supplementary instruction. That objectives with regard to teaching how to use liaison are very limited is evidenced by the following frame:

> 958 "Since it is necessary to know French syntax before you can learn the proper placement of liaisons we shall consider only the most important cases in which a liaison is mandatory or forbidden."

What is disturbing here is the apparent effort on the part of the

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4. *Principes de Phonétique Française*, Vermont, (2ed. 1951), page 26. (tr mine) "La liaison se fait dans la mesure où l'usage a consacré l'extrême étroitesse d'union de deux mots ou classes de mots: ils_entrent, un petit_habit."
5. *ibid.*, page 20

programmer to achieve more than make the student recognize liaison when it occurs in spoken utterances and have him determine whether or not a liaison is to be made on the basis of such minimal instruction.

Burroughs endeavours to establish close links between two classes of words: nouns and preceding determinatives (frame 959), between pronouns, adverbs, prepositions and the words following them (frame 967), and to separate other classes of words: nouns and the word following (frame 971) conjunctions and what follows (frame 970) and especially "et" and what follows (frame 969) Without expecting students to be familiar with French syntax, she paradoxically expects them to recognize the conventional parts of speech including articles, possessive and demonstrative adjectives, adjectives preceding the noun (frames 959, 963) and recognize these in the printed text. On the information provided concerning the transcription of vowels and consonants, the learner could be expected to write what he heard in the Burroughs phonetic script. To anticipate more appears unjustified if the programme is used for self-instruction purposes as intended.

The use of an audio source in what is fundamentally a written linear programme is commendable since Burroughs contrives to make students transcribe Parisian French into phonetic script[6]. The introduction of examples such as the following:

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[6] Introduction to the programme: "The author is Eliane Burroughs, Instructor in French at Hollins College. It is her voice which you hear on the tape. She is a native speaker of French with an accent which is characteristic of a cultivated Parisienne."

> 961. Pronounce the following nouns and their preceding determinatives and write them in phonetic script: 1 mon élève. .. 2. un artiste. ,3. cinq arbres (pl).... Note: Remember that the "s" of the plural is not pronounced.
>
> 965. Pronounce the following expressions (adj.-plus-noun) and write them in phonetic script: 1. jeune éléphant... 2. méchante abeille... 3. petit arbuste...
>
> 975. Pronounce the following sentence and indicate the liaisons with a slur:
> Detr.adj.noun                    noun
> Mon ancien ami parle et écrit l'anglais et le français

suggests that Burroughs attempts to teach her students to read a printed text and transcribe it into phonetics. Reluctantly one is led to the conclusion that Burroughs intended to instruct students to transcribe French whether spoken or written into phonetic script and failed to analyse the information required and the skills involved to achieve more than her first objective. However, if the programme is not used as originally intended for self-instruction in French phonetics, if the teacher is available to supplement what is missing in the programme, if a knowledge of French grammar is presupposed, Burroughs second apparent objective may also be realised. With regard to the phenomenon of liaison in particular, the teacher can recognize from inspection of the frames that the aims of the author are very limited. Only the deliberate conversational speech of a "cultivated" Parisienne can be transcribed on completing the programme and no attempt is made to deal with permissible liaisons nor to identify styles of delivery.

Indications that the Programmed Course in French Phonetics has much wider aims than the title indicates may be gleaned from the statements which describe its contents:

> "The sounds of French are contrasted with English sounds and with each other. The student is taught to recognize and to produce the French vowels and consonants; discriminations are forced by the use of phonetic symbols. Drills on pronunciation and transcription increase the student's familiarity with each new sound After the student has learned to recognize and produce a sound, he is taught the different ways in which this sound may be represented or "spelled". When he has learned to produce all of the sounds, he studies syllabication, stress, elision, liaison, and loss of the weak vowel in rapid speech," 6.

From the analysis of skills made in the first chapter, it is clear that the recognition and production of French vowels and consonants involves their being contrasted among themselves. To avoid interference from the learner's native English, it is a good teaching technique to differentiate between French and English sounds What is attempted by the programme is to "force" these discriminations by the use of phonetic symbols, and more significantly, to associate the sounds with conventional French spellings. The implication seems to be that the student who completes the course should be able to transcribe in phonetic script what he hears or reads in French with the limitations previously observed with regard to liaison. Burroughs appears to have the further pragmatic view that the student's pronunciation can be improved in the process. This impression is reinforced by the constant direction to students to repeat sounds they hear or pronounce words they see written and compare their efforts with the programmer's production.

To sum up, the objectives of the programme appear to be: instructing students to recognize Parisian French and

Standard English phonemes, to discriminate between them and to pronounce them accurately The phonemes are associated with a phonetic alphabet which the students are to recognize and use in transcription from spoken and written French. Without depending on grammatical explanation, the programmer sets out to teach for recognition and use patterns of French syllabication and stress, the pronunciation of double consonants, the role of /ə/ in rapid speech, elision and liaison. The success with which these objectives are realized can be determined partly by close inspection of the programme content and partly by validation tests.

8.2 Scrutiny of the programme must establish not only the extent to which its content is accurate but also its efficiency as a tool of instruction. Burroughs does not mention phonemes herself but refers to their graphic representation as phonetic symbols (frames 8ff), by way of contrast with their conventional spelling which she calls "graphemes". (frame 29). We can accept her terminology on both scores however much at variance with common practice[7]. We can similarly accept her adopting a convention of phonetic spelling varying in three instances from the International Phonetic Alphabet. What is not explained at all or what is by implication erroneously conveyed does merit close attention.

The question of medial or mid-close vowels in French is simply not broached[8]. When the programme comes to differentiate between open and close E, examples of medial E, are conveniently classified as either one or the other as is common practice[9]. But Burroughs' programme leads the student to imagine that there is no change of vowel quality in pairs of words like: "éclairer, éclairant; baisser, baissant; il y est, y est-il?"[10]. There are curious frames (18 and 81) where French vowels /i/ and /e/ are claimed to be shorter than their English counterparts. What Burroughs does not point out is that the shorter an E sound becomes, the more closed (the more like /e/) it tends to become[11]. Again in frame 223, over-simplification leads to creating erroneous information for the student who wants to distinguish between /œ/ and /ø/[12]. The examples cited cannot be discounted as areas on which distinguished scholars disagree; given the limits of vocabulary to be used in the programme and the legitimate wish to avoid giving exhaustive lists of exceptions, it is unacceptable that information programmed should be simply false. It is false to say, as Burroughs implies, that Corneille's "Polyeucte" is pronounced with /œ/ as for that matter is the biblical "Pentateuque." Again, howelse can one differentiate "le jeune" and "le jeûne" except by noting that "eû" is pronounced /ø/? Furthermore, Gide would have been astonished to learn from Burroughs that his "aveugle" rhymed with "la vache qui beugle". On the other hand, the character of the errors of fact in the programme does not overshadow its efficacy as a tool for instruction in phonetics and pronunciation.

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[7] See for example Hanley and Thurman: Developing Vocal Skills, NY, (1962), pages 66ff, on Speech Sounds and Symbols.

[8] Delattre: Advanced French Pronunciation, Colorado, (1949), page 41

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[9] *ibid.*; see also Fouché: *Traité de Prononciation française*, *Paris*, (2ed 1959), pages 47ff.

[10] *ibid.*, page 71

[11] Simon: "Films radiologiques des articulations et les aspects génétiques des sons du langage", *Orbis*, X,(1961), page 61. In this well-documented report he cites the work of Durand: *Voyelles longues et voyelles brèves*, (1946), as basic.

[12] Fouché, *op. cit.*, pages 54 ff.

It is important that a linear programme elicit a constructed response that is significant and not incidental to the train of thought being developed. However, to return to the series of frames on liaison, it seems far-fetched to introduce a new topic and expect the student to guess the very second word in the sentence, even when the concept was spoken about four pages earlier. It seems poor teaching to have to remind students approaching the end of the programme that the "s" of a plural is not pronounced (frame 960-1). It seems that the prime object of a programme on French phonetics must be to make the student who completes it independent of the type of learning prop it provides To keep ideas once mastered fresh in the minds of the students by having them use them is sound pedagogy, but to lead them to depend on prompts in the closing phases of instruction scarcely appears calculated to produce this independence.

The sequence of frames on liaison would be a valid means of instruction if the type of student for whom the programme was written could in fact learn effectively from it All the students in the writer's experimental class had qualified at the level of the Victorian Matriculation examination in French and been admitted to the first year course of French language and literature designed for those intending to major in the subject. The French phonetics course was used in thirty minute segments to supplement formal training in grammar and literary appreciation. What cannot be proved incontrovertibly in such circumstances is that the programme alone sufficed as a source of instruction for acceptable performance of French pronunciation What can be said is that the type of student for whom the programme was written appears to improve his recognition and production of French phonemes as well as gain some fundamental notions about phonetic transcription when the course is used in conjunction with other language practice. The professor who wrote the introduction to the materials claimed that six groups of subjects went through successive revisions of the material[6]. No other validation data is available.

8.3 The format of the programme provides for no branching or skipping. Every student must work through every frame irrespective of prior knowledge. Every student must have his own copy of the booklet and his own tape-recorder on which to work through the pre-recorded ancillary audio material. On the face of things, the use of the library system of unmonitored self-instruction in the language laboratory with this programme forces students to waste time. Given that the students have previous knowledge of French, they must either follow out the programme in full or make their own decisions about what they can afford to omit. Those without preliminary classroom instruction in self-criticism cannot hope to evaluate their vocal responses to the programme objectively and could waste time in attempting such a task. Two remedies are possible: the installation of a mechanical device to evaluate performance or the presence of a monitor available for consultation and capable of training students to recognize the sounds they produce. If, however, a monitor with the text in front of him is to be in a position to supervise the work of more than one student at a time, the pre-recorded tape as it is currently marketed will need to be somewhat altered.

The problem, as the writer has encountered it, is that the monitor cannot know what the student is reading. If he listens to the student, he can hear what the student hears and hear the student response. The student knows what part of the programme he is working at but the monitor has to wait for the tape to read out a number before he can discover how far the student has progressed and what he is studying. For the purposes of monitoring, the audio tape would be improved if the instructions prescribing rules or introducing examples were added to the tape. The writer prepared sequences from the programme in this way and used them to advantage with his experimental class.

8.4 Underlying the Skinnerian format of the programme with its constructed responses to each frame is the method employed in communicating the ideas to the student. Analysis of the sequence appended to this chapter as a sample of the procedure adopted shows that the author begins by prescribing rules (frames 957 and 958). Frame 959 particularises the rule and gives the student examples to work out. Whether consciously or not, the author has adopted a system of writing elaborated by Homme and

Glaser under the name: Ruleg[13]. Frame 960 has the student listen to further examples from the audio source and transcribe what he hears in phonetic script; frame 961 has the student read some examples, transcribe them into phonetic script and check the accuracy of the transcription from the tape. Unfortunately all the worked examples are heavily prompted and do not appear to encourage retention of the principles involved (as would the use of incomplete rules for which the student would have to remember the significant endings) or the application of these principles in concrete circumstances. The technique of gradual withdrawal of prompts to encourage increased retention has been the subject of experimentation with children and college students Glaser and Tabor taught colour concepts to five and six year olds by this process[14]; Angell and Lumsdaine in working with 174 fourth, fifth and sixth grade students showed that for long-term retention of content, programmes using vanishing techniques were significantly more efficient than those persisting with full prompting throughout the programme despite similar scores by all students immediately on completing their assignment[15]. Rothkopf secured analogous results with college students whose immediate retention lasted longer but whose performance four months after the initial learning favoured those who had developed mnemonic devices to memorize the programme content[16]. Thus Burroughs' frame 962 states explicitly what the student should be expected to recall at least covertly: "that a liaison occurs when a word begins with a 'silent h'". The remainder of the frame consists of identifying in the French words spoken the particular consonant used in making a liaison. Frames 963 and 967 contain rules followed by examples, while 964 to 966 are heavily prompted examples. At no stage is the student required to retain any information in his head Frame 968 is a generalization embracing the preceding instructional rules; one would have thought that an incomplete formulation would have been an excellent way to summarize the knowledge acquired up to this point but the constructed response required of the student is merely to identify the phenomenon as "liaison". It is true that twenty frames later, Burroughs has the student listen to the tape give four examples and ask the student to transcribe them into phonetic script. In only two of the examples does liaison occur and no effort is made to discover whether the student can apply the rules of liaison when reading a French text aloud.

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[13] "Problems in Programming Verbal Learning Sequences", (1959), in Lumsdaine and Glaser (eds): Teaching Machines and Programmed Learning, Washington, (1960), pages 486-496.

[14] Investigations of the Characteristics of Programed Learning Sequences, Pittsburgh, (1961), Chapter 9 also published in the Journal of Educational Research, 53, (1962), pages 508-512.

[15] Retention of Material Presented by Autoinstructional Programs which Vanish and which do not Vanish Verbal Cues, Palo Alto, (1962).

8.5 Had Burroughs revised her programme not so much in order to exclude errors when students worked through it as to encourage their retention of what was taught, she might have been led to base her programme on a matrix analysing the teaching sequence, the content of the frames, and the efficacy of the responses sought[17]. By incorporating the Ruleg system, this refinement facilitates the discovery of logical connections and contrasts, and prevents the fragmentation of a sequence into a random assortment of unrelated comments about the topic. Such a matrix derived from the sequence on liaison is given in Panel 4. Several features emerge from it.

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[16] "Programed Self-Instructional Booklets, Mnemonic Phrases, and Unguided Study in the Acquisition of Equivalences", Journal of Programed Instruction, I, (1962), pages 19-28.

Examination of the matrix for the sequence on liaison suggests that in the rule expressed in frame 959, the concept of the determinative preceding the noun could be enlarged to take in all adjectives preceding their nouns (frame 963). This would make for continuity of development. The next break occurs at 967 and can be resolved by introducing frame 968 before it. A slight rewording would reinforce the contrast between the liaison found when a subordinating conjunction (e.g.: quand) introduces a clause and its non-appearance when a coordinating conjunction is used (e.g.: et, mais). Indeed, so much material is referred to in frame 967 and so few examples given that one wonders whether frame 967 might not be rendered more effective by substantial increase in content and possibly division into three or more frames. After the contrast between obligatory and forbidden liaisons is made, Burroughs formulates in frame 972

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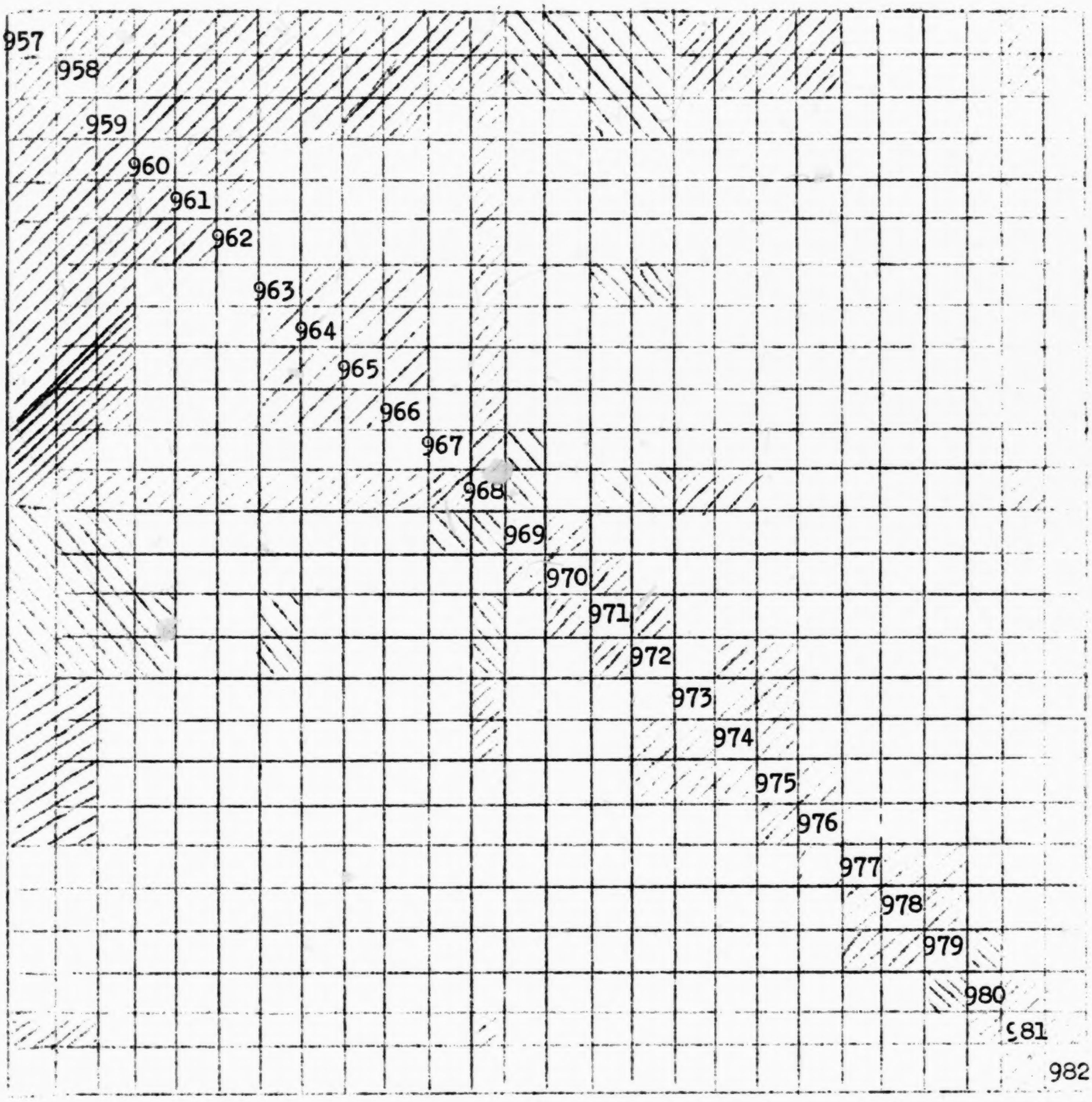
[17] Thomas, Davies, Openshaw and Bird: Programmed Learning in Perspective, Barking, Essex, (1963), pages 44 ff.

Panel 4. Ruleg (expression of theory in terms of rules and examples) Matrix. The Matrix is composed of a definition line representing the logical progression from one point to the next. Relationships between the frames are either similarity or contrast. While it is normal to construct a separate flow diagram showing how each principle is expressed in a series of rules, incomplete rules, examples, incomplete examples, it is more instructive in the present instance to treat each frame as a separate step in the logical progression and hence examine the relationships of each frame in the sequence with the others.



INTERPRETATION: There are gaps in continuity without direct association or contrast between 962 and 963, 966 and 967, 972 and 973, 976 and 977.

CONCEPT AREAS: Compulsory and Forbidden liaisons are the only concepts identifiable on this Ruleg Matrix, seen in the dark squares with the line of contrasts at 968 to mark the two off from each other. The whole area deals with liaison in one form or other.

a generalization which echoes frame 967 while intended to stand in opposition to frame 968. But that same frame 972 shows only a tenuous connection with frames 973 and 974 where the ability to transcribe French speech is tested. Two curious elements deserve comment: the answer to frame 974 prints a slur between "aimable" and "enfant" - where by definition no liaison can take place; and the answer frame to 974 prints no slur between "sans" and "arrêt" though frame 967 had expressly taught that liaison takes place after "sans" These oversights can be rectified in later printings. A curious break in continuity occurs between frames 976 and 977 where the concept of elision is suddenly reintroduced as a transition to the discussion of the /ə/ 'caduc' and five frames later another switch is made to return to testing the use of liaison Such a procedure cannot be understood in terms of Carroll's cyclical programming where topics are reintroduced into a sequence according to a spiral pattern.

The actual text of the Ruleg programme can be improved by ensuring that early frames on consonant and vowel phonemes actually teach what they set out to teach. Sufficient exercise of the theory expounded has to be given at an early stage to render unnecessary reminders at later stages in the programme. Such reminders are found in frames 960, 961, 962, 964, 974, and 977 and should be quite superfluous. They serve as prompts at a stage in the programme when knowledge previously gained should be recalled through usage according to a cyclical pattern calculated to prevent its being forgotten. Prompts concerning matters other than liaison, if present at all, could well be minimised and restricted to an incomplete rule or example - a pattern of writing which the experimentation cited earlier in this chapter showed to favour long-term retention.

Frames 960 and 961 test successively transcription of spoken and written French in phonetic script. Since they follow frame 959 containing the rule on which they are based and some worked examples, it seems unnecessary to mention to the student that he is dealing with nouns and their preceding determinatives. The programme is not intended for students without prior acquaintance with French, and such additional clues as to what is required in the examples appears to conflict with recall. The student still has an answer key from which to check whether he has understood what liaison entails or not. The following frame (962) with three examples of pairs of French words to be read aloud and transcribed into phonetic script seems again excessively prompted and lacking in opportunity for practice. The point being established is that liaison takes place and that a particular consonantal phoneme is used. Frame 962 could test student achievement on both these points if the four pairs of words given were replaced by four short sentences in one of which no liaison took place. The frame could then be reworded:

962' "If liaison takes place in the following examples, write the phonetic symbol for the sound heard in making it: 1. J'ai écouté deux histoires. 2. Il a attendu trois heures. 3. Il s'est servi d'un oreiller. 4. Où sont les cinq haches

If the nature of the tape accompanying the programme is altered to make it easier for a monitor to assist students working upon it, all the instructions now printed in the text will be read aloud on the tape. The student will have to stop the tape from time to time when transcribing examples into phonetic script as long pauses on the tape would tend to annoy the faster or more proficient student and still prove too short for the struggler. Where French words are to be read from the programmed book, the student should know from preliminary instruction that the tape must be stopped until the assignment is completed. Given the presence of a monitor to assist with pronunciation defects among the students, it would be very desirable that he could stop the student's tape-recorder at will to give remedial instruction, a facility offered by language laboratories with overriding controls at the monitor's console.

While minimal steps are very desirable for the early stages of any programmed sequence, experimentation cited in the chapter on linear programming[18] suggests that students perform more satisfactorily if the size of step progressively increases as the programme continues. Experience shows that a programmed sequence like the twenty odd frames on liaison is long enough to cover a topic satisfactorily. At the same time, it can be conveniently completed in a period of some twenty to thirty minutes which can be considered optimal for sustained effort on the part of the college students for whom the text

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18. Chapter II, section 2.2

was designed. There is a danger when a long programme continues on for a thousand frames, as does Burroughs' programme that students will lose interest at the seeming endlessness of their efforts. More obvious division of the programme into the several topics covered could increase student motivation by making it clear as in The Analysis of Behavior that one part of the course has been mastered and a new section is being introduced.

Panel 5. Extracts from A Programmed Course in French Phonetics, by Eliane Burroughs, Temac Programmed Learning Materials, Chicago, Encyclopaedia Britannica, 1961, 1000 frames.

"Anyone who has access to a tape player can take this course. The programmed text is fitted into a Temac binder. Together with the accompanying tapes, it brings you the advantage of tape-text learning.

For the first time, French Phonetics is presented in an easily understandable form. The material is broken down into small steps; it is prepared for a student who has no initial knowledge of phonetics. He constructs his own responses and proceeds step by step at his own pace. After each step, he receives immediate reinforcing knowledge of results. Thus, he is an active and constant participant in the learning process.

This course represents much more than a presentation of the author's approach to teaching French Phonetics. Six groups of subjects have gone through successive revisions of the material. About 100 people helped to write this book. In particular, I wish to thank Cynthia Dee Buchanan, Instructor in Linguistics at Hollins College, and Neil E. Sullivan, Assistant Director of the Britannica Center for Studies in Learning and Motivation, for their guidance and help.

It must be emphasized that these materials have a relatively narrow scope. They do not represent an independent way to learn the French language. The program has given excellent results when used along with a first-course in French, and as a review of French sounds for students who have already had one or more years of French. It can also be used as an independent First Course in French Phonetics for French majors, or to train FLES teachers in the sounds of French. The author is Eliane Burroughs, Instructor in French at Hollins College. It is her voice which you hear on the tape. She is a native speaker of French with an accent which is characteristic of a cultivated Parisienne.

French Phonetics covers the following material:

1. A brief introduction to the linguistic approach.
2. The French vowel sounds (oral and nasal vowels, semi-vowels)
3. The French consonant sounds
4. French orthography, including irregular spellings
5. Liaisons and elisions
6. Loss of /ə/ in rapid speech
7. Double consonant sounds
8. French stress and syllabication

The sounds of French are contrasted with English sounds and with each other. The student is taught to recognize and to produce the French vowels and consonants; discriminations are forced by the use of phonetic symbols. Drills on pronunciation and transcription increase the student's familiarity with each new sound.

After the student has learned to recognize and produce a sound, he is taught the different ways in which this sound may be represented or "spelled". When he has learned to produce all of the sounds, he studies syllabication, stress, elision, liaison, and loss of the weak vowel in rapid speech.

This is the first of our programmed courses to be released. In my opinion, it represents a great step forward in the field of French language teaching.

M. W. SULLIVAN
Professor of Modern Languages and
Director of Graduate Studies
Hollins College, Virginia.

957. A .... , which consists of pronouncing a final consonant with an initial vowel, is mandatory in certain cases in French, forbidden in others. There is no liaison when there is a punctuation mark, or a possible breath pause. There is a liaison between words which are never separated, and we must consider the syntax or placement of words in an utterance in order to determine whether or not a liaison is to be made.
liaison

958. Since it is necessary to know French syntax before you can learn the proper placement of liaisons, we shall consider only the most important cases in which a liaison is mandatory or forbidden. In general, when inseparable words are spoken in the same breath, a liaison occurs between a final .... and an initial ....
consonant, vowel

959. There is usually a liaison between a nouns and the determinative which precedes it. This determinative may be an article, a possessive or demonstrative adjective, a number, etc. Repeat the following expressions and write them in phonetic script:* (* indicates - listen to tape)
1. les enfants ..... 2. un an ...... 3. son ami .....
4. cet été ...... 5. deux agneaux .........
1.lezɑ̃fɑ̃ 2. œ̃nɑ̃ 3. sɔ̃nami 4. sɛtete 5. døzano

960. Repeat the following nouns and their preceding determinatives and write them in phonetic script:* 1. des idées (pl.) ..... 2. une auto .....
3. ton or ..... 4. cette aile ..... 5. trois oies (pl.) .....
Note: Remember that the "s" of the plural does not represent a sound.
1.dezide 2. ynoto 3. tɔ̃nɔr 4. sɛtɛl 5. trwazwa

961. Pronounce the following nouns and their preceding determinatives and write them in phonetic script: 1. mon élève ..... 2. un artiste .....
3. cinq arbres (pl.) ..... Note: Remember that the "s" of the plural is not pronounced. Listen to the tape and check your phonetic script.*
1. mɔ̃nelɛv 2. œ̃nartist 3. sɛ̃karbr

962. In the following expressions write the phonetic symbol representing the consonant sound in the liaisons:* 1. deux histoires (..) 2. trois heures
3. un oreiller (..) 4. cinq hommes (..)
1./z/ 2./z/ 3./n/ 4./k/

963. There is usually a liaison between an adjective and the following noun. Repeat the following adjective plus noun expressions and write them in phonetic script:* 1. gros ennui .... 2. petit oiseau ....
3. méchant enfant ....
1. grozɑ̃nɥi 2. pətitwazo 3. mešɑ̃tɑ̃fɑ̃

964. Repeat the following adjective-plus-noun expressions and write them in phonetic script:* 1. grand air ..... 2. grande ourse .....
Note: Remember that a final "d" becomes /t/ in liaison, and that "d" before final "e" always represents /d/.
1. grɑ̃ter 2. grɑ̃durs

965. Pronounce the following expressions (adj.-plus-noun) and write them in phonetic script: 1. jeune éléphant .... 2. méchante abeille ....
3. petit arbuste .... Listen to the tape and check your phonetic script.*
1. žœnelefɑ̃ 2. mešɑ̃tabɛj 3. pətit_arbyst

966. Write the phonetic symbol which represents the consonant sound in the liaisons in the following expressions (adj.-plus-noun):* 1. grande histoire /../ 2. grand espoir /../ 3. jeunes élèves (pl.) /../
1. /d/ 2./t/ 3./z/

967. Liaisons are also generally made after a pronoun, an adverb and a preposition. Repeat the following expressions and write the phonetic symbol which corresponds to the consonant sound in the liaison:*
1. elle alla /../   2. sans avoir /../   3. quand il va /../
(pro.)   (prep.)   (adv.)
1. /l/   2. /z/   3. /t/

968. In general a ... occurs when there is no possible breath pause between two closely related words (such as determinative-plus-noun, etc.) and after a pronoun, a preposition and some adverbs.
liaison

969. The "t" of the conjunction et can never be pronounced with a following word beginning with a vowel. Repeat the following expressions and write them in phonetic script:* 1. lui et elle .... 2. large et étendu ...
3. jeune et aimable ...
1./lɥieɛl/   2./larželetɑ̃dy/   3./žœneemabl/

970. There is no liaison after most conjunctions and never after the conjunction ...
et

971. A noun is not subject to liaison with the following word as a general rule. (There are a few exceptions). Repeat the following expressions beginning with a noun and write them in phonetic script:*
1. mets agréable ... 2. coup imprévu ... 3. saluts amicaux ...
1./meagreabl/   2./kuɛ̃prevy/   3./salyamiko/

972. A ... cannot be made when there is the possibility of a breath pause and in general after nouns, some conjunctions and adverbs. Never make a liaison after the conjunction et.
liaison.

973. Repeat the following sentence and indicate with a slur between the words (_) the liaisons which you hear:*
Detr. adj. noun adj. noun
Un aimable enfant étonné et amusé regardait le grand ours.
Un_aimable_enfant étonné et amusé regardait le grand_ours.

974. Repeat the following sentence and indicate the liaisons with a slur:*
Detr. adj. noun verb prep. pron.
Les autres abeilles aspirent le nectar sans arrêt et en emportent
Note: Remember that the "ent" ending of a verb is not pronounced.
Les_autres abeilles aspirent le nectar sans arrêt et en_emportent.

975. Pronounce the following sentence and indicate the liaisons with a slur:
Detr. adj. noun noun
Mon ancien ami parle et écrit l'anglais et le français
Listen to the tape and check your script.*
Mon_ancien_ami parle et écrit l'anglais et le français.

976. Pronounce the following sentence and indicate the liaisons with a slur:
On aime les enfants obéissants et intelligents. Listen to the tape and check your script.*
On_aime les_enfants obéissants et intelligents.

977. Remember that before a vowel and a "silent h", a /ə/ in a single-syllable word is dropped and replaced by an apostrophe, thus causing an ...
Note: /ə/ is pronounced before an "aspirated h" even in rapid speech.
Example: le hameau /lə'amo/
elision

978. In rapid speech, a /ə/, other than the final /ə/, is also frequently dropped from a word; although the "e" remains in the script, it is not pronounced. Listen to the word petit then to the same word in an expression spoken in rapid speech.*
The word petit is written /...../ in phonetic script but in rapid speech it becomes /pti/.

pəti

979. Repeat the word acheter, then the expression: j'ai acheté un manteau (as in rapid speech).* The word acheter is written /ašəte/ in phonetic script but it becomes /..../ in rapid speech.

/ašte/

980. /../ (always represented by "e") within a word is pronounced when it is preceded by several consonant sounds. It is not pronounced when preceded by a single consonant, unless it is followed by a consonant-plus-semivowel. Example:* fortement - sagement - genièvre.

/ə/

981. Repeat the following sentences and write them in phonetic script:*
1. Il a des ennemis ..... 2. Voici l'épicerie ..... 3. La bergerie est ici ..... 4. Nous viendrons mercredi .....

1. /iladezɛnmi/ 2./vwasilepisri/ 3./labɛržərietisi/ 4./nuvjɛ̃drɔ̃mɛrkrədi/

982. When a /e/ follows a single c.... sound it is not pronounced in rapid speech. It is pronounced if it is preceded by several consonants.

consonant

# CHAPTER IX: A LANGUAGE LABORATORY PROGRAMME FOR THE STUDY OF LITERATURE

9.0 Role of language laboratory in the study of literature

9.1 A Survey of programmes available for literary study

9.2 _Forme et Fond_, objectives, content and instructional techniques

9.3 Some suggestions for improvement

9.0 The study of literature is based on reading a text after due introduction. Usually lectures speak of the author and his aspirations, of his life and work, and afterwards of the book to be studied. Subsequent tutorials give the students an opportunity to see how other people reacted to the work under discussion. The language laboratory could make available pre-recorded lectures for absentee students and even allow them to listen to discussions by groups other than their own. Similarly dramatised readings of the text can be heard and facilities for such opportunities are usually provided in Universities. Nothing so far justifies the use of a language laboratory. Only a programme allowing for overt student participation (when appropriate) and aimed at teaching ideas singularly difficult to communicate in a group situation makes the expense of the preparation of materials and presentation devices desirable. The unique contribution which teaching programmes can make to the study of literature seems to be a close study of phonostylistic elements leading the student to an informed appreciation of a work of art. Not even lecture or discussion can make a student enjoy what he fails to notice; even more than an explication, the language laboratory can help the student to savour the expressive nature of the literary work presented by the sounds of the words.

From infancy children are trained to neglect meaningless changes in the quality of voices speaking their native language. Indeed the physical and acquired limitations to what individuals perceive is sometimes underestimated. The pain of a dentist's drill for instance can be eclipsed solely by the quality and intensity of other noise the patient hears[1]. Leon points out that "a Spaniard who can only distinguish a single vowel quality in French is not equipped to evaluate a poem of Baudelaire's or a play of Claudel's satisfactorily.[2]"

As explained in previous chapters, programmes can provide discrimination training which is more efficient than what is possible in a group situation. Not only must the student become sensitive to sound quality but he must also come to evaluate the choice of words. In a literary work the form, including the rhythmic flow and figures of speech, produces something beyond the information content. In a very real sense, as McLuhan observes, the medium is the message[3]. The particular programme taken for detailed scrutiny in this chapter, Forme et Fond by Breunig, Mesnard, Carlson and Geen prefaces its exercises with the remark that questions on the literary texts studied not only test comprehension but emphasize "the close connection between style and content, between forme and fond.[4]"

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[1] Mc Luhan, Understanding Media, NY, (1964), page 44. Device known as "Audiac".

[2] Laboratoire de langues et correction phonétique, Paris, (1962), page 231. Translation by the writer. His discussion of phonostylistics begins on page 170.

[3] op.cit., pages 7, 10, and 21.

[4] Breunig, Mesnard, Carlson and Geen: Forme et Fond, NY, (1964), page vii

9.1 Before we examine Forme et Fond, we shall look at an elementary programme designed to inaugurate literary studies in English for native speakers deserves attention as an example of how an adjunctive programme can be used to study literature Instead of giving introductory lectures and discussions on authors and their works, the Literature Sampler presents passages from books of some merit. In Karen, for example, the incident of the heroine's falling overboard from a boat is studied[5]. On finishing this reading, the student attempts a multiple-choice questionnaire with questions like:

"What concerns her parents most about Karen?"

Reasonably difficult alternatives are supplied which demand an accurate reading of the text. When the questionnaire has been completed, a "discussion" card subsumes the various alternatives and explains the rights and wrongs of the options much like a series of frames written as first order branches in an intrinsic programme The pupil reads for enjoyment, answers the questionnaire in his work-book, and is provided with confirmation or remedial teaching as required He is introduced to types of humour, presentation and style, and is encouraged to read the full-length book:

> "Can Karen's parents and sister help her to live with cerebral palsy? For the dramatic story of this girl, read Karen." 6

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5. Killilea, (1952), as presented in the Literature Sampler, Secondary edition by Rita E Mc Laughlin and Earle J. Eley, Encyclopaedia Britannica, Chicago, (1962).
6 See the teacher's manual to accompany the Literature Sampler. The particular citation here is from folder 134 of the Secondary edition.

The ideas incorporated in this programme could be adapted to designing adjunctive audio programmes for the study of foreign literature in the language laboratory. The same presentation of literary texts could be used, but in this case, the printed text would be accompanied with a tape on which the author or actors would read the extract while the student listened. This audio-lingual presentation moves much faster than the reading of foreign language texts by students even at university level[7]. Multiple-choice questionnaires can be added to the tapes to test comprehension and the appreciation of choice of words, patterns and structures. The tape can conclude with explanations of the merits or otherwise of the various options given, a practice apt to make a greater impression on students than when the same instruction begins the study. By that stage the students have had to form opinions of their own about each of the issues under discussion and are encouraged to query outlooks adopted by the programmers who thus open up the texts for closer scrutiny.

A similar project is the S.R.A. *Pilot Library*[8]; the main difference is the lack of any attempt in this programme to provide any semblance of remedial instruction. *The Great Books of the Western World* are accompanied by study guides called: *The Great Ideas Program*, Volume VII of which is *Imaginative Literature II from Cervantes to Dostoevsky*[9].

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[7] The writer's personal experience with two experimental classes at Monash University during 1964 and 1965 is the basis of this remark.

[8] Chicago, (1962)

[9] By Adler and Cain, Encyclopaedia Britannica, Chicago, (1962).

The guide to Volume 52: Dostoevsky's Brothers Karamazov follows the same general pattern of the other introductions. Two pages place the type of book in its literary context, three more give a brief outline of the author's biography while a further thirty-five summarize the long work on the levels of themes and plot. Page 247 is a constructed response quiz designed to test the thoroughness of one's reading of the whole book and the answer key contains precise page references to points where responses can be checked in the actual text. Four other pages raise more important questions concerning the literary evaluation of the book, questions to which the authors claim there are no dogmatic answers:

> "Does the murder of Fyodor Karamazov and all that leads up to it and follows from it convey the meaning of Dostoevsky's theme to you? What of the psychological responses and development of the characters? Do they emerge from and reinforce the major ideas of the novel?..." 10.

Alongside the microscopic analysis of the Literature Sampler, the macroscopic lines of the Great Books with their supplementary essays in Volume V of the ten volume Gateway to the Great Books[11] presents a complete contrast. To discover the scope of literary studies in a foreign language in the language laboratory, we turn to Forme et Fond and the Newsletter of the M.L.A. Conference on the Language Laboratory and the Teaching of Literature[12].

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10. ibid., page 243.
11. Encyclopaedia Britannica, Chicago, (1963) including critical essays by Virginia Woolf, Matthew Arnold, Arthur Schopenhauer, William Hazlitt, Thomas de Quincey and Thomas Eliot - to mention a few.
12. Volume I, (1961/2) edited by Professor J. Pleasants, Columbia University, NY.

9.2 The authors of Forme et Fond claim that their purpose is not to provide an introductory course in literature but to use the extracts chosen from fourteen French masters "who have made the best possible use of the instrument which the students themselves are handling "[4] to teach language patterns. Their objective is defined as "to bring students of varying backgrounds and skills up to a standard where they can intelligently approach the study of French literature "[4]. An attempt has been made to exemplify a large variety of styles and types of writing. The authors set out to test the student's comprehension of the details of each text and provide exercises intended for grammar review, study of idiomatic expression, vocabulary building and free composition centred on the texts. As a test of accuracy and subtlety of comprehension, the authors provide exercises in translation serving as an introduction to an art they feel to be one of the pleasures and benefits of the study of a foreign language. The sentences illustrating grammatical principles are drawn as much as possible directly from the texts for study and from the point of view of oral exercises in the laboratory these same texts are used to teach everything from pronunciation to literary analysis (page viii).

The student is first provided with a paragraph of introduction to the author and one or two extracts from his work. Later the language laboratory exercises draw attention in detail to only a fraction of what is printed in the book; not even the whole extract printed in the book is read in the laboratory to let him hear French spoken. The questions in the text are not followed by answers, but in Chapter I the last three of a set of a dozen questions are expanded in the language laboratory text to twice that number and the taped answers are drilled. The student is expected to prepare the answer to a question like: "Pourquoi l'image du 'roseau pensant' résume-t-elle l'idée de ce passage?"[13] In the language laboratory, he is expected to speak an answer to this question when asked, but no provision is made for him to compare his ideas with those of the teacher or to listen to the programmer's views on the merits and failings of various opinions. The language laboratory tapes concentrate lesson by lesson on various aspects of pronunciation and grammar. A number of comprehension and composition exercises are distributed among the chapters, now questionnaire, now dictation, now critical comparison of two versions of the same text.

The question arises, to what extent is the material programmed? Certainly many of the imitative frames involve a little initial instruction and a variety of expressions to be repeated. These exercises differ little from copy frames in a linear programme and only the first show any logical progression or any real effort to encourage and test retention.

eg. "En français, les syllabes prononcées à l'intérieur d'un mot ou d'un groupe de mots ont tendance à se terminer par une voyelle. Ecoutez ces exemples: nature, u-ni-vers, va-peur, a-van-tage, di-gni-té, prin-cipe, mo-rale. Maintenant répétez en distinguant bien chaque syllabe: na-ture ..  14.

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13. Script of Magnetic Tape to Accompany Forme et Fond, NY, (1964), page 8.

14. ibid , pages 1 and 2

The next exercise tests retention of this point and adds the new element of the tonic accent falling on final syllables. The student is first asked to note the contrast between French accent and English stress and respond by marking the accented syllables. This frame contrasts with the previous one in that it proceeds empirically and allows the student to note the generalization for himself:

> "Dans les mots suivants, écoutez le contraste entre le français et l'anglais. Prenez un crayon et, dans les mots français, soulignez la syllabe qui reçoit l'accent tonique. na'ture/nature, u'niverse/univers, va'por/vapeur..., 14.

The words are then pronounced and the position of the tonic accent noted when these words occur in sense groups. Once again the generalization follows the student response. In other words, a ruleg frame is followed by two egrule ones[15], essentially linear in conception. In the printed extract which concludes this chapter, it will be seen that exercises five and six are partly inductive partly normative, one dealing with intonation patterns to be imitated, the other with the use of "de" after a superlative adjective. Exercise seven is the first which attempts to follow an adjunctive approach to test comprehension; the eighth is the first with any pretence at looking to literary appreciation:

> "Pourquoi l'image du 'roseau pensant' résume-t-elle l'idée de ce passage?"

This in fact is the 10th of 12 questions on the text provided for classroom study. The unfortunate aspect of the language laboratory tape is that no attempt is made to express the programmer's opinion. There is no discussion of various possible answers to the question as is provided in the Literature Sampler; there is no real attempt to probe very far in an effort to realize the stated objective; to bring students "up to a standard where they can intelligently approach the study of French literature "[4]. The sole justification of including an exercise on "de" is that pages 6 and 7 of the classroom text gives a letter of Madame de Sévigné containing many superlatives. In the laboratory tape some phrases are used which could be employed in discussing Pascal's work in a tutorial or seminar but in the sequence as it stands these are a sheer interpolation. The closest approach to preparing students for literary study in chapter I is to be found in the unanswered questions in the classroom text and its concluding translation from English into French of critical comment on epigrammatic writing.

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[15] Markle, Good Frames and Bad, NY, (1964), page 97

The finest attempt in the language laboratory exercises to prepare for serious literary study is to be found in the eighth session[16]. The reading of the poem is here followed by a pronunciation drill which prepares the student for his own repetition of the reading, phrase by phrase. The 14th of the fifteen classroom text questions is used as a stimulus to the student's critical comment:

> "Comment le titre résume-t-il l'état d'esprit qu'évoque le poème?"[17]

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[16] reference in note 13, pages 73-81.

[17] reference in note 4, page 111; reference in note 13, page 75.

The fifth exercise is a linear sequence on the form of the poem (for which see the extract at the end of this chapter.) There are certain basic facts about sonnets which every student of literature has to know; the language laboratory programme ensures that all the relevant factual detail is mastered. The place of the /ə/ caduc in poetry is explained and the student tested by having him apply his knowledge in reading the poem himself The rhyme scheme is next examined and again the student works empirically after learning the meaning of the terms applied to describing it To ensure that the student can handle his newly gained vocabulary, he is asked to apply it to a second sonnet of Baudelaire.

The student of Forme et Fond will achieve relatively little if he fails to understand the literary extracts the book contains. The classroom text's grammatical summary may help with syntactical problems, but on the whole neither this nor the laboratory tape really comes to grips with training in comprehension. Exercises designed with this purpose in mind are too few and too short. Little effort is made to probe beyond surface meaning; no attempt is made to help the student with finding the total meaning of the poem on his own[18]. Outside the classroom, the student is given little help to evaluate what he reads as a work of art

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18. Ogden and Richards: The Meaning of Meaning, Cambridge, (1923, 8ed 1946), rp.,NY, 1965, page 220.

The professed aim of preparing students for the study of literature is realized to the extent that the old-fashioned approach to review grammar in 120 pages can assist the understanding of the literary text. Grammatical exercises provided certainly do not appear to have direct bearing on the texts except insofar as examples are drawn from the texts; they make no pretence of attempting to deal with stylistics which would appear to be their main justification in such a work as this. Some attention is given to improving the student's ability to read aloud. This aspect of the programme is well done and suitably structured. No provision is made within the programme for dealing with opinions expressed in answer to the only questions raised which bear directly on the study of the literary texts as literature - a defect that could easily be remedied.

9.3 When a programmer expresses an opinion on literary matters, he does not need to be dogmatic and the student is not bound to agree. In his excellent linear programme: Poetry: a Closer Look[19], Reid very cleverly introduces high-school pupils to the sorts of things to look for in a poem. In dealing with the use of symbol in a poem by Frost, for instance, he brings the student to the point where he can agree:

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[19] Harcourt, Brace and World, NY, (1963). The first part by Reid occupies 37 pages; part II by Perrine is an eleven page lecturette on Rhythm and Meter; part III by Ciardi spends sixteen pages to discuss Metaphor in Poetry; part IV is a 50 page anthology furnished with short directives preceding each poem compiled by all three.

> "The contemplation of beauty, the poet seems to be saying, deserves its place in a full life, but not at the expense of one's social obligations and duties. To surrender to beauty at the sacrifice of duty is equivalent to one's d,   , as a responsible person.

death In "Stopping by Woods" the narrator, after moments of mental conflict, accepts the...., he has made, though not without regret.

choice or decision. (page 16).

He then makes a transition to the discussion of how the sounds of the poem appeal to the mind and emotions of the reader. Forme et Fond could have done something similar.

Dramatisations of scenes from plays, extracts from novels, and selected plays can be made more pertinent to the student if a short introduction summarizes the action and alerts him about what to watch for. The native speaker for whom literary works were written has a specific background which the foreign language student must learn before deriving comparable enjoyment. Julien Green admirably introduces recorded selections of Moïra and Sud by placing the scenes in context in their works and in their cultural setting; this procedure could be followed for many other authors to the benefit of students of literature. Such recordings are doubly useful if an adjunctive programme assists comprehension and evaluation of stylistic elements in much the same way as does the writer's sample programme on a poem of Apollinaire which is appended to this chapter. It matters little whether the basic information is furnished through lecturette, discussion of contrary outlooks, "interviews" with the author, or simply a questionnaire directing the student's attention to important points. The object of such preliminaries is to provoke the student into thinking about the issues involved when reading the texts himself. Everything in such a programme is designed to "open up" the work for the reader.

Written forms of literary works have an existence quite independent of spoken renditions and on occasions depend in part on the format of their presentation[20]. It therefore seems over-generalization to claim with Léon: "Our literature (French) began orally with poems to be sung before being written. A language is spoken before it is written.[21]" It may well be true that a novel is shown at its best when narrated by a story-teller; a poem certainly reveals more of its rhythm and music, more of the quality of its repetitions and pauses and all the multitude of stylistic devices including rhyme, alliteration and assonance when it is read aloud But Enkvist points out that the total meaning of a work involves both these stylolinguistic aspects and the reader's response to them and that written texts carry important features of their own which are lacking in spoken language[22]. Further, the reader's response to a foreign literary work needs to be enriched with an understanding of the reaction its author expected from his native reading public. The student in the language laboratory must learn the emotional or ironic overtones of the selection he is studying and the implications and refinements of expression which the native reader appreciates as superior to conversational speech; the student in other words is penalized unless he is given an insight into the mediation process the work elicits in the native-born reader[23]. The consequences for language laboratory programmes for the study of literature are these: firstly the purely linguistic drills on the grammar of the language must make the student aware of everyday usage; secondly the stylistic exercises associated directly with the study of a particular text are of little use unless they help the student gain an insight into the native-born reader's response to the work. Expressed in Enkvist's terms:

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[20] Nida: Learning a Foreign Language, NY, (1950), pages 140-141.

[21] op cit , page 231, translation mine.

[22] "On Defining Style: an Essay in Applied Linguistics", in Spencer (ed), Linguistics and Style, London, (1964), pages 48-49.

> "The aim of the teaching is to make explicit the correlation between stylolinguistics and stylobehaviouristics, and thus make the students respond to the specific stimuli described by stylolinguistics in a manner determined by models found through stylobehaviouristics. Interference from the student's first language, social bias and past experience must be reckoned with in the selection of materials and methods." 24.

Richmond in his Teachers and Machines tried to achieve the same sort of teaching aim that Enkvist speaks about[25]. His 211 frame programme introducing the matriculation student to the principles of appreciating an English sonnet appears to be strictly linear in format. On close examination, he sometimes intersperses multiple-choice options in frames like numbers 10, 11, 13, 36, 37. Why does he do this? Let us examine Frame 37:

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23. Osgood, Suci and Tannenbaum: The Measurement of Meaning, Urbana, Illinois, (1957), page 318. See previous discussion in Chapter V, section 5.4

24. op.cit., pages 50-51.

25. London, (1965), pages 200ff.: "Specimen Programme: Principles of Literary Criticism".

> "The metre (='measure') used in the English sonnet is known as IAMBIC PENTAMETER. Each line contains ..... iambic feet. Only one of the following, therefore, could occur in a sonnet: (5)
> (a) The fair breeze blew, the white foam flew.
> (b) When I consider how my light is spent.
> (c) O young Lochinvar is come out of the West. Which? (b)

This frame contains a test of the student's ability to scan a verse to determine the number of feet. A Skinnerian constructed response does not seem appropriate to determine whether the reader can recognize what sort of verse can occur in an English sonnet. It would appear that Richmond's purpose determines the response mode he requires in his programme. Elsewhere, like Reid in Poetry, a Closer Look, Richmond asks the student to refer to the text of a poem printed in a "panel"[26] to work out the rhyming scheme. At this stage the technique is Skinnerian, but in the second part of the programme a frame asks a student to read two sonnets and compare them. It continues:

> "One of these is a bad egg. Find the dud, then turn to page 251."[27]

Page 251 not only gives an answer but an eight line discussion of it, concluding with an invitation to the student to disagree with the classification in Fowler's English Usage of the better of the two poems.

With many of Richmond's frames, the likelihood of a student's being able to make an error is minimal and the need for an answer sheet to confirm the reader's response seems to be eliminated[28]. Richmond does in fact add an answer sheet, though the way in which the constructed response to be made in one frame is taken up by the following one reminds us of Barlow's Conversational Chaining technique discussed in Chapter V It would seem that this approach would be particularly valuable in an audio programme like Forme et Fond because it would eliminate the need to put in correct responses for repetition and would allow sequences on stylolinguistics or stylobehaviouristics to develop naturally without interruption. Reid's and Richmond's programmes demonstrate to the incredulous that Léon's hopes for a study of phonostylistics in the language laboratory are a practical possibility.

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[26] Here frame 59 refers the reader to page 229 where Milton's sonnet "On his Blindness" is printed.

[27] Richmond, op.cit., page 238.

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[28] ibid., frames 19-20, 22-23, 27-28, on pages 203-204 for instance.

Panel 6: FORME ET FOND, L.C. Breunig, André Mesnard, Helen Carlson, Renée Gee
The Macmillan Company, New York, 1964.

vii: Preface. "C'est dans les bons auteurs qu'il faut chercher la connaissance des langues". This simple statement, which appeared in the statutes of the Université de Paris in 1600, is no less true today. The texts which we present, by fourteen masters of French literature from Pascal to Valéry, are not intended for an introductory course in literature, but as a basis for language study. If literature is indeed "the significant use of language," does it not follow that one of the most effective ways in which the student can master the language itself is by coming to grips with its literary masterpieces? It seems most appropriate in the courses where the stress is necessarily upon the language that great writers should be studied, not as representatives of periods of French civilization, but as superior artists who have made the best possible use of the instrument which the students themselves are handling.

Experimental versions of this text have been used for the last several years at Barnard College in a course designed to bring students of varying backgrounds and skills up to a standard where they can intelligently approach the study of French literature. The integrated course consists of fourteen units of work, each of which is made up of the following elements: literary texts, questions on the texts, exercises based on the readings and referring to the reference grammar, and laboratory exercises specifically based upon the readings and exercises of that unit.

The present book contains the following material:

(a) Literary texts brief enough to be studied intensively. In selecting these passages we have tried to illustrate a wide variety of styles and genres. Since it would have been impossible and inappropriate to present a complete compilation, we have arranged the texts, not according to genres, but chronologically over the four centuries.

(b) Questions on the texts. These are designed to test the student's comprehension of the details of each text and to emphasize for him the close connection between style and content, between forme and fond.

(c) Exercises based on the reading just completed. These contain grammar review, idiom study, verb drill, vocabulary building, and compositions,
viii all of them integrated with the literary texts. The exercises of the fourteen units provide a thorough grammar review, arranged according to the salient grammatical difficulties occurring in the reading selections of each chapter. (The superlative, for example, is studied in connection with Mme de Sévigné's letter on the marraige of the Duc de Lauzun.) A review of points closely related to texts that have just been studied has the advantage of impressing these points more deeply on the students' minds. Occasional exercises in translation from the French are included in order to challenge the easy acceptance of vague and approximate readings of the texts. This test of accuracy and subtlety of comprehension also serves to initiate the student into the art of translation, one of the pleasures and benefits of language study.

(d) The reference grammar, which presents in French a detailed set of rules of French grammar and usage, arranged according to the parts of speech. Before beginning each grammar exercise the student is asked to study carefully relevant sections of the grammar. The sentences illustrating each rule are, wherever appropriate, drawn directly from the texts of the fourteen chapters. Thus the principle of integration which inspired the preparation of the textbook is completed in the reference grammar which follows it.

The student manual for the laboratory exercises is presented in a separate book of *Exercices de laboratoire*, which are recorded on magnetic tapes. Each exercise is based upon a brief excerpt from a text in the chapter just completed in class. The student in the laboratory is asked to repeat the passage, line by line after the voice on the tape; the passage then serves as a basis for a series of oral exercises in pronunciation, grammar review, vocabulary building, and literary analysis. At the end of the hour the student is requested to memorize the selection or a part of it. In addition, each of the laboratory lessons contains one written exercise (dictation, oral comprehension tests, etc.), which is to be forwarded from the laboratory to the student's instructor for grading.

Both the manual of *Exercices de laboratoire* and the tapes are available separately, and it is strongly recommended that they be used in conjunction with the present book. However, the book can, if necessary, constitute a complete course in itself for those who do not want to include laboratory work.

Since the authors wish to require students at this level to use not only a good French-English dictionary but more particularly a recent edition of an all-French dictionary, such as the *Petit Larousse*, no glossary is included.

We wish to express our gratitude to Professor Tatiana Greene, Professor Elizabeth Czoniczer, and other colleagues of the French Department of Barnard
ix College who have taught the experimental versions of this text, and to Professor Renée Kohn for her critical reading of the manuscript. We owe a special debt to Professor Jeanne Varney Pleasants of Columbia University for her encouragement in the use of literary texts for the language laboratory, to Miss Elizabeth Blake for her generous assistance in the preparation of the laboratory exercises, and to Professor Michael Riffaterre of Columbia University and Miss Jacqueline Desrez for their services in the recording of the laboratory tapes. We also express our thanks to Miss Victoria Rippere (Barnard class of 1965) for the preparation of the map which accompanies *Un Coeur simple*, and to Miss Mary Ringwald for her invaluable assistance in the preparation of the manuals from which this text grew.

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3 *Chapitre I:* "A" PASCAL (1623-1662) - *Pensées*. Blaise Pascal, mathématicien, physicien, et l'un des plus grands penseurs du XVIIe siècle, mourut avant d'avoir terminé une *Apologie de la religion chrétienne*. Les notes pour cet ouvrage ontété publiées après sa mort sous le titre de *Pensées*. En s'adressant à "l'honnête homme" de son siècle Pascal essaye de l'éveiller de sa torpeur, de lui faire comprendre qu'il existe une contradiction fondamentale entre sa "misère" et sa "grandeur" Pascal a donc perfectionné un style qu'il appelle "l'art de persuader" ou "l'éloquence". Il cherche non seulement à convaincre la raison de son lecteur par la force rigoureuse de sa logique mais encore à l'émouvoir en touchant son imagination et sa sensibilité. Car, disait-il, "le coeur a ses raisons que la raison ne connaît point." Voici deux extraits des *Pensées*.

*Disproportion de l'homme*... Que l'homme contemple donc la nature entière dans sa haute et pleine majesté, qu'il éloigne sa vue des objets bas [1] qui l'environnent. Qu'il regarde cette éclatante lumière, mise comme une lampe éternelle pour éclairer l'univers; que la terre lui paraisse comme un point au prix du [2] vaste tour que cet astre décrit, et qu'il s'étonne de ce que ce vaste tour lui-même n'est qu'une pointe très délicate [3] à l'égard de celui que les astres qui roulent dans le firmament embrassent. Mais si notre vue s'arrête là; que l'imagination passe outre; elle se lassera plutôt de concevoir que la nature de fournir. Tout ce monde visible n'est qu'un trait imperceptible dans l'ample sein de la nature. Nulle idée n'en approahe. Nous avons

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[1] bas: terrestres. [2] au prix de: en comparaison de. [3] délicate: fine.

4 beau enfler nos conceptions au delà des espaces imaginables, nous n'enfantons que des atomes, au prix de la réalité des choses. C'est une sphère infinie dont le centre est partout, la circonférence nulle part. Enfin, c'est le plus grand caractère sensible [4] de la toute-puissance de Dieu, que notre imagination se perde dans cette pensée.

Que l'homme, étant revenu à soi, considère ce qu'il est au prix de ce qui est; qu'il se regarde comme égaré dans ce canton [5] détourné de la nature; et que, de ce petit cachot où il se trouve logé, j'entends l'univers, il apprenne à estimer la terre, les royaumes, les villes et soi-même son [6] juste prix. Qu'est-ce qu'un homme dans l'infini?

Mais pour lui présenter un autre prodige aussi étonnant, qu'il recherche dans ce qu'il connaît les choses les plus délicates; qu'un ciron [7] lui offre, dans la petitesse de son corps, des parties incomparablement plus petites, des jambes avec des jointures, des veines dans ses jambes, du sang dans ses veines, des humeurs [8] dans ce sang, des gouttes dans ses humeurs, des vapeurs dans ces gouttes; que, divisant encore ces dernières choses, il épuise ses forces en ces conceptions, et que le dernier objet où il peut arriver soit maintenant celui de notre discours; il pensera peut-être que c'est là l'extrême petitesse de la nature. Je veux lui faire voir là-dedans un abîme nouveau. Je lui veux peindre [9] non seulement l'univers visible, mais l'immensité qu'on peut concevoir de la nature, dans l'enceinte de ce raccourci d'atome. Qu'il y voie une infinité d'univers, dont chacun a son firmament, ses planètes, sa terre, en la même proportion que le monde visible; dans cette terre, des animaux, et enfin des cirons, dans lesquels il retrouvera ce que les premiers ont donné; et trouvant encore dans les autres la même chose, sans fin et sans repos, qu'il se perde dans ces merveilles, aussi étonnantes dans leur petitesse que les autres par leur étendue; car qui n'admirera [10] que notre corps, qui tantôt n'était pas perceptible dans l'univers, imperceptible lui-même dans le sein du tout, soit à présent un colosse, un monde, ou plutôt un tout, à l'égard du néant où l'on ne peut arriver?

Qui se considérera de la sorte s'effrayera de soi-même, et, se considérant soutenu dans la masse que la nature lui a donnée entre ces deux abîmes de l'infini et du néant, il tremblera dans la vue de ces merveilles; et je crois que, sa curiosité se changeant en admiration, il sera plus disposé à les contempler en silence qu'à les rechercher avec présomption.

Car enfin qu'est-ce que l'homme dans la nature? Un néant à l'égard de l'infini, un tout à l'égard du néant, un milieu entre rien et tout. Infiniment éloigné de comprendre [11] les extrêmes, la fin des choses et leur principe sont pour lui invinciblement cachés dans un secret impénétrable, également incapable de voir le néant d'où il est tiré, et l'infini où il est englouti...

* * *

L'homme n'est qu'un roseau, le plus faible de la nature; mais c'est un roseau pensant. Il ne faut que l'univers entier s'arme pour l'écraser: une vapeur, une goutte d'eau, suffit pour le tuer. Mais, quand l'univers l'écraserait, [12] l'homme serait encore [13] plus noble que ce qui le tue, puisqu'il sait qu'il meurt, et l'avantage que l'univers a sur lui, l'univers n'en sait rien.

Toute notre dignité consiste donc en la pensée. C'est de là qu'il faut nous relever [14] et non de l'espace et de la durée, que nous ne saurions remplir. Travaillons donc à bien penser; voilà le principe de la morale.

4. sensible: qui ne peut échapper aux sens. 5. canton: coin. 6. son: au lieu de leur parce qu'il se rapporte à l'idée contenue dans l'énumération. 7. ciron: le plus petit des animaux visibles à l'oeil nu. 8. humeurs: substances liquides. 9. Je lui veut peindre: en français moderne, on écrirait: Je veux lui peindre. Au XVIIe siècle, et moins fréquemment aux siècles suivants, le pronom personnel précédait le verbe auxiliaire que l'infinitif. 10. admirera: verra avec étonnement. 11. comprendre: embrasser avec l'esprit. 12. quand l'univers l'écraserait: même si l'univers l'écrasait. 13. encore: même dans ce cas. 14. C'est de là qu'il faut nous relever: c'est notre pensée qui sera le principe de notre noblesse.

5 QUESTIONS. Disproportion de l'homme

1. Quelle phrase de Pascal résume le mieux l'idée principale de ce passage?
2. Ce texte est souvent intitulé "les deux infinis". Quels sont ces deux infinis?
3. Caractérisez le mouvement du premier paragraphe. Par quelles étapes l'auteur passe-t-il de la "vue des objets bas" à celle d'"une sphère infinie"?
4. Notez la série des verbes au subjonctif. Pourquoi Pascal a-t-il employé ce mode de préférence à l'impératif?
5. Quelle est la fonction du deuxième paragraphe dans l'ensemble du morceau?
6. Caractérisez le mouvement du troisième paragraphe et montrez en quoi il ressemble à celui du premier tout en s'y opposant.
7. Notez comment le quatrième paragraphe, en reprenant le thème des paragraphes précédents, cherche à éveiller l'inquiétude du lecteur. Quels sont les termes qui expriment cette inquiétude?
8. Le quatrième paragraphe vous semble-t-il opposer l'esprit religieux à l'esprit scientifique? Justifiez votre réponse.
9. Au cinquième paragraphe relevez les termes qui par leur opposition font ressortir la position de l'homme dans la nature.

Le roseau pensant

10 Pourquoi l'image du "roseau pensant" résume-t-elle l'idée de ce passage? Notez les termes qui font ressortir la faiblesse de l'homme et ceux qui expriment sa grandeur.

11 A quoi se rapporte le pronom en dans: "l'univers n'en sait rien"?

12 Relevez et expliquez l'importance des conjonctions: mais, au premier paragraphe, et donc, au dernier.

SCRIPT OF MAGNETIC TAPE TO ACCOMPANY FORME ET FOND, NY, Macmillan, 1964.

1 Première séance de laboratoire. Cette séance se compose de dix exercices.

Premier exercice. Audition du texte. (reproduite à la page précédente après les astérisques.)

Deuxième exercice. Prononciation: syllabification.

En français, les syllabes prononcées à l'intérieur d'un mot ou d'un groupe de mots ont tendance à se terminer par une voyelle. Ecoutez ces examples:
na-ture u-ni-vers va-peur a-van-tage di-gni-té prin-cipe mo-rale
2 Maintenant répétez en distinguant bien chaque syllabe:
na-ture u-ni-vers va-peur a-van-tage di-gni-té prin-cipe mo-rale
Ecoutez votre enregistrement.

Troisième exercice. Prononciation: accent tonique.

Dans les mots suivants, écoutez le contraste entre le français et l'anglais. Prenez un crayon et, dans les mots français, soulignez la syllabe qui reçoit l'accent tonique (underline the syllable which is stressed).
na'ture / nature u'ni-verse / univers va'por / vapeur ad-van'tage / avantage dig'ni-ty / dignité prin'ci-ple / principe mor'al / morale
Si vous avez bien fait cet exercice, vous avez souligné -ture dans "nature",
3 -vers dans "univers", -peur dans "vapeur", -tage dans "avantage", -té dans "dignité", -cipe dans "principe", -rale dans "morale". Dans un mot isolé, l'accent tonique tombe donc régulièrement sur la dernière syllabe prononcée.
Répétez: nature /--/ univers /--/ vapeur /--/ avantage /--/ dignité /--/ principe /--/ morale /--/
Ecoutez maintenant le contraste entre le mot isolé et le mot dans un groupe rythmique (a sense group which represents a simple thought):

nature / la nature humaine  universe/ l'univers entier  vapeur / la vapeur d'eau
avantage / le grand avantage  dignité / notre dignité  principe / le premier principe  morale / la morale chrétienne
Remarquons que dans le groupe rythmique c'est la dernière syllabe prononcée du groupe qui reçoit l'accent tonique. Répetez: La nature humaine /--/ l'univers entier /--/ la vapeur d'eau /--/ le grand avantage /--/ notre dignité /--/ le premier principe /--/ la morale chrétienne /--/
Ecoutez votre enregistrement.

4 Quatrième exercice. Lecture en groupes de mots: accent tonique.
Voici des exemples de groupes rythmiques tirés du passage que nous étudions:
Travaillons donc à bien penser  voilà  le principe  de la morale
Pour faciliter la lecture des passages que nous étudierons dans les séances de laboratoire, nous ne nous arrêterons pas toujours à la fin de chacun de ces groupes. Vous entendrez par exemple: Travaillons donc à bien penser / voilà le principe de la morale. Ecoutez de nouveau cette phrase en remarquant que, même quand la fin d'un groupe ryhtmique n'est pas suivie d'un arrêt, elle est marquée par un accent tonique: Travaillons donc à bien penser / voilà le principe de la morale. Répetez pendant l'arrêt. Articulez bien. Faites attention aux accents toniques qui marquent la fin de chaque groupe rythmique:
L'homme n'est qu'un roseau, /--/ le plus faible de la nature,. /--/ mais c'est un roseau pensant. /--/ Il ne faut pas que l'univers entier /--/ s'arme pour l'écraser: /--/ une vapeur, une goutte d'eau /--/ suffit pour le tuer. /--/ Mais, quand l'univers l'écraserait,/--/ l'homme serait encore plus noble que ce qui le tue, /--/ puisqu'il sait qu'il meurt, /--/ et l'avantage que l'univers a sur lui, /--/ l'univers n'en sait rien. /--/
5 Toute notre dignité /--/ consiste donc en la pensée. /--/ C'est de là qu'il faut nous relever /--/ et non de l'espace et de la durée, /--/ que nous ne saurions remplir./--/ Travaillons donc à bien penser; /--/ voilà le principe de la morale. /--/ Ecoutez votre enregistrement.

Cinquième exercice. Lecture en groupes de mots: intonation.
Répetez de nouveau le passage. Marquez les accents toniques. Imitez aussi les intonations que vous entendrez. Ne craignez pas de faire monter la voix aussi haut ou de la faire descendre aussi bas que le modèle. (texte ci-dessus)

6 Sixième exercice. Grammaire: emploi de la préposition "de" après le superlatif. Ecoutez de nouveau cette phrase du passage: "L'homme n'est qu'un roseau, le plus faible de la nature..." Remarquez qu'après le superlatif, le français emploie "de" là où l'anglais emploie "in". Vous entendrez trois mots. Reliez-les d'après ce modèle. Exemple: l'expression / frappant / passage /---/ l'expression la plus frappante du passage.
Ayez soin de bien faire accorder l'adjectif avec le nom qu'il qualifie.
Répetez la réponse que vous entendrez. le mot / frappant / passage /---/ le mot le plus frappant du passage /---/
la comparaison / frappant / passage /---/ la comparaison la plus frappante du passage /---/
les idées / frappant / passage /---/ les idées les plus frappantes du passage.
7 l'attribut / digne / homme /---/ l'attribut le plus digne de l'homme /---/
la qualité / digne / homme /---/ la qualité la plus digne de l'homme /---/
les travaux / digne / homme /---/ les travaux les plus dignes de l'homme /---/
le principe / important / morale /---/ le principe le plus important de la morale /---/ similarly la règle, les aspects instead of le principe.
le passage / éloquent / Pensées /---/ le passage le plus éloquent des Pensées /---/ similarly la phrase, les paragraphes instead of le passage.
Passez à l'exercice suivant.

7 Septième exercice. Maniement de la langue parlée: exercice d'assouplissement.

Répondez rapidement aux questions suivantes, puis répétez la réponse.
A quoi Pascal compare-t-il l'homme? /---/ Il le compare à un roseau. /---/
8 Qu'est-ce qui suffit pour tuer l'homme? /---/ Une vapeur, une goutte d'eau suffit pour le tuer. /---/
En quoi consiste notre dignité? /---/ Notre dignité consiste en la pensée/---/
Qu'est-ce que nous ne saurions remplir? /---/ Nous ne saurions remplir ni l'espace ni la durée. /---/
Quel est le principe de la morale? /---/ Le principe de la morale est de travailler à bien penser. /---/
Voici de nouveau les questions. Répondez-y sans la moindre hésitation. Nous ne vous donnerons pas de réponse. (Questions ci-dessus).
Ecoutez votre deuxième enregistrement.

Huitième exercice. Composition orale: question sur le texte.

Répondez par quelques phrases à la question suivante que vous avez préparée en classe. Enregistrez votre réponse.
Pourquoi l'image du "roseau pensant" résume-t-elle l'idée de ce passage? /---/
Ecoutez votre réponse et, s'il y a lieu, corrigez-la.

9 Neuvième exercice. Dictée.
Ecoutez, sans écrire, cette lecture d'un autre passage des Pensées.

Ce n'est point de l'espace que je dois chercher ma dignité, mais c'est du règlement de ma pensée. Je n'aurai pas d'avantage en possédant des terres; par l'espace, l'univers me comprend et m'engloutit comme un point; par la pensée, je le comprends.
Nous vous donnerons la ponctuation de cette dictée en français: "virgule", en anglais "comma"; "point", en anglais "period"; "point virgule",,en anglais "semi-colon"; "deux points", en anglais "colon". Maintenant écrivez: (texte de la dictée ci-dessus). Ecoutez la dictée une dernière fois: (la dictée est relue) Mettez votre dictée de côté et passez à l'exercice suivant.

10 Dixième exercice. Passage à apprendre par coeur.

Voici de nouveau le passage de Pascal. Apprenez-le par coeur. (texte à la page 169 de cette thèse) Fin de la première séance de laboratoire.

...........

110 FORME ET FOND, CHAPITRE VIII "B".

Les Fleurs du Mal contiennent une cinquantaine de sonnets dont plusieurs comptent parmi les plus beaux de la langue française. Cette forme fixe, empruntée à l'Italie au XVIe siècle, se compose d'ordinaire de deux quatrains suivis de deux tercets. Les règles strictes qui gouvernent l'agencement des quatorze vers et la disposition des rimes imposent à tout poète une contrainte rigoureuse. Chez Baudelaire l'intensité même de l'émotion porte à un effort de concentration qui donne à ses sonnets toute leur puissance de suggestion. Recueillement est à cet égard particulièrement émouvant.

RECUEILLEMENT

Sois sage, ô ma Douleur, et tiens-toi plus tranquille.
Tu réclamais le Soir; il descend; le voici:
Une atmosphère obscure enveloppe la ville,
Aux uns portant la paix, aux autres le souci.
Pendant que des mortels la multitude vile,
Sous le fouet du Plaisir, ce bourreau sans merci,
Va cueillir des remords dans la fête servile,
Ma Douleur, donne-moi la main; viens par ici,

Loin d'eux. Vois se pencher les défuntes Années,
Sur les balcons du ciel en robes surannées;
Surgir du fond des eaux le Regret souriant;
Le Soleil moribond s'endormir sous une arche,
Et, comme un long linceul traînant à l'Orient,
Entends, ma chère, entends la douce Nuit qui marche.

Questions: 1. Quel rapport entre le poète et sa douleur la forme des verbes au premier vers suggère-t-elle? Relevez les cinq autres verbes du poème par lesquels le poète s'adresse à sa "Douleur".
2. Pourquoi le poète demande-t-il à sa Douleur d'être "sage"?
3. Quelle progression indiquent les trois propositions du vers 2?
4. Quel serait l'ordre ordinaire des mots du vers 5? Sur quel mot l'ordre choisi par Baudelaire met-il l'accent? Indiquez le sujet de Va (v.7).
5. Quel rapport existe-t-il entre l'image présentée au vers 6 et le choix de remords comme objet du verbe cueillir (v.7)?
6. Où pensez-vous que le poète mène sa Douleur en lui disant "par ici" (v.8)?
7. Quel est l'effet obtenu par le rejet de Loin d'eux au début du premier tercet?
111 8. Comment les "défuntes Années" sont-elles personnifiées (v.9-10)?
9. De quel verbe dépendent les infinitifs se pencher (v.9), surgir (v.11), et s'endormir (v.12)? Quel est l'effet produit par ces infinitifs?
10 Pourquoi le Regret est-il souriant?
11 De quelle "arche" s'agit-il au vers 12?
12 Pourquoi est-ce à l'Orient que traîne le linceul?
13 Caractérisez le rythme du dernier vers.
14 Comment le titre résume-t-il l'état d'esprit qu'évoque le poème?
15 Comment la disposition des rimes unit-elle les deux quatrains; les deux tercets?

73 SCRIPT OF MAGNETIC TAPE. Huitième séance de laboratoire.

Cette séance se compose de sept exercices.
Premier exercice. Audition du texte. Ecoutez Recueillement de Baudelaire. (voyez le texte ci-eessus)
74 Deuxième exercice. Prononciation: /e/ /ɛ/
/e/ Répétez: les /--/ des /--/ années /--/ surannées /--/ se pencher /--/ défuntes /--/
/ɛ/ Répétez: paix /--/ fouet /--/ le Regret /--/ fête /--/ mortels /--/ chère /--/ atmosphère /--/ Baudelaire /--/
/i/, /e/, / /: mis, mes, mais /---/ lis, les, laid /---/ si, ses, c'est /---/
Tu réclamais le soir; il descend; le voici: /---/
Vois se pencher les défuntes Années, /---/
Sur les balcons du ciel, en robes surannées; /---/
Surgir du fond des eaux le Regret souriant; /---/
Ecoutez votre enregistrement.

75 Troisième exercice. Lecture en groupes de mots.
Répétez pendant les pauses en faisant particulièrement attention à la prononciation de /i/, /e/, /ɛ/: (texte du poème ci-dessus)
Ecoutez votre enregistrement.

Quatrième exercice. Composition orale: question sur le texte.
Répondez par quelques phrases à la question suivante que vous avez préparée en classe. Enregistrez votre réponse.
Comment le titre, Recueillement, résume-t-il l'état d'esprit qu'évoque le poème? /---/
76 Ecoutez votre réponse et, s'il y a lieu, corrigez-la.

76 *Cinquième exercice*. *Quelques éléments de versification*.

En regardant le texte de ce poème, répondez aux questions suivantes, puis écoutez la réponse que nous vous donnerons.

Quelle est la forme de ce poème? /---/ C'est un sonnet.

Combien de vers a ce poème? /---/ Il en a quatorze.

En combien de strophes ces vers sont-ils divisés? /---/ Ils sont divisés en quatre strophes.

Combien de vers a chacune des deux premières strophes? /---/ Chacune a quatre vers.

Comment s'appelle une strophe de quatre vers? /---/ Une strophe de quatre vers s'appelle un quatrain.

Combien de vers a chacune des deux dernières strophes? /---/ Chacune a trois vers.

Comment s'appelle une strophe de trois vers? /---/ Une strophe de trois vers s'appelle un tercet.

Combien de syllabes ont les vers de ce sonnet? /---/ Ils en ont douze.

Comment s'appelle un vers de douze syllabes? /---/ Un vers de douze syllabes s'appelle un alexandrin.

Notons comment l'*e* muet entre dans le compte des syllabes du vers classique français. A l'intérieur du vers, on compte tous les *e* muets suivis de consonnes.

Regardez la fin du troisième vers: ... enveloppe la ville.

Dans la conversation, on dirait, en quatre syllabes: ...env~~e~~-lopp~~e~~-la-ville.

A l'intérieur du vers, on ne compte pas les *e* muets suivis de voyelles, même d'un mot à un autre.

Regardez le commencement du troisième vers: U-n~~e~~ at-mos-phè-r~~e~~ obs-cu-r~~e~~ en-ve-lo-ppe...

L'*e* muet disparaît devant la voyelle, et la dernière consonne avant l'*e* muet se joint à la syllabe suivante. Ecoutez de nouveau: U-n~~e~~ at-mos-phè-r~~e~~ obscur~~e~~ en-ve-lo-ppe...

A la fin du vers, on ne compte pas l'*e* muet. Ainsi on ne compte qu'une syllabe pour "ville". Voici les douze syllabes du premier vers du sonnet:
Sois-sa-g~~e~~ ô-ma-dou-leu-ret-tiens-toi-plus-tran-quille

Lisez à haute voic le deuxième vers en séparant bien les syllabes. /---/
Tu-ré-cla-mais-le-soi-ril-de-scend-le-voi-ci

Lisez à haute voix le troisième vers en séparant bien les syllabes. /---/
U-n~~e~~at-mos-phè-r~~e~~ob-scu-ren-ve-lo-ppe-la-ville

78 Lisez à haute voix le quatrième vers en séparant bien les syllabes. /---/
Au-xuns-por-tant-la-paix-au-xau-tres-le-sou-ci.

Examinons maintenant les rimes. Qu'est-ce qu'une rime féminine? /---/ Une rime féminine est une rime qui se termine par un "e" muet. Regardez le texte du poème et lisez à haute voix toutes les rimes féminines. /---/ tranquille, ville, vile, servile, années, surannées, arche, marche.

Qu'est-ce qu'une rime masculine? /---/ Une rime masculine est une rime qui ne se termine pas par un "e" muet. Regardez le texte du poème et lisez à haute voix toutes les rimes masculines. /---/ voici, souci, merci, ici, souriant, Orient.

Combien de rimes différentes y a-t-il dans les deux quatrains? /---/ Il y a deux rimes différentes, une rime en -*ille* et une rime en -*ci*.

Combien de rimes différentes y a-t-il dans les deux tercets? /---/ Il y a trois rimes différentes, une rime en -*nées*, une rime en -*riant* et une rime en -*arche*.

Quand les rimes masculines alternent avec les féminines, on les appelle rimes "croisées". Y a-t-il des exemples de rimes croisées dans ce sonnet? /--/ Oui, les deux quatrains ont des rimes croisées, ainsi que les quatre derniers vers du sonnet.

Lisez à haute voix ces rimes croisées. /---/ tranquille, voici, ville, souci;
79 vile, merci, servile, ici; souriant, arche, Orient, marche.

Quand les rimes se succèdent deux à deux, on les appelle rimes "plates"; y a-t-il un exemple de rimes plates dans ce sonnet? /---/ Oui, les deux premiers vers du premier tercet.

Lisez à haute voix ces rimes plates, /---/ années, surannées.

Quand deux vers à rimes plates sont entourés par deux vers rimant entre eux, les rimes sont dites "embrassées". Y a-t-il un exemple de rimes embrassées dans ce sonnet? /---/ Non. Refaites cet exercice. Cette fois-ci essayez de répondre sans la moindre hésitation.

Sixième exercice. Eléments de versification: exercice écrit.

Nous allons vous lire un autre sonnet de Baudelaire, intitulé la Beauté. Ecoutez simplement.

La Beauté

Je suis belle, ô mortels! comme un rêve de pierre,
Et mon sein, où chacun s'est meurtri tour à tour,
Est fait pour inspirer au poète un amour
Eternel et muet ainsi que la matière.

Je trône dans l'azur comme un sphinx incompris;
J'unis un coeur de neige à la blancheur des cygnes;
Je hais le mouvement qui déplace les lignes,
Et jamais je ne pleure, et jamais je ne ris.

80 Les poètes, devant mes grandes attitudes,
Que j'ai l'air d'emprunter aux plus fiers monuments,
Consumeront leurs jours en d'austères études;

Car j'ai, pour fasciner ces dociles amants,
De purs miroirs qui font toutes choses plus belles:
Ses yeux, mes larges yeux aux clartés éternelles!

Ecoutez le sonnet encore une fois, en faisant attention au dernier mot de chaque vers, au mot "pierre", par exemple, à la fin du premier vers: "Je suis belle, ô mortels! comme un rêve de pierre" Ecrivez le dernier mot de chaque vers sur la feuille de l'exercice. Voici de nouveau le poème: (le poème est relu). Regardez les autres questions sur la feuille de l'exercice. Répondez-y puis passez à l'exercice suivant.

Septième exercice. Poème à apprendre par coeur.

Ecoutez de nouveau Recueillement. Apprenez le poème par coeur. (texte ci-dessus
Fin de la huitième séance de laboratoire.

W. KENNETH RICHMOND: *Teachers and Machines*, London, Collins, 1965.

Chapter 8. Specimen Programme: Principles of Literary Criticism. (pp.201-253)

In order to illustrate how the programme develops, some excerpts are reprinted here to which Chapter 9 of the thesis refers.

| | Answer key |
|---|---|
| 9. In the Arts the answers to many important questions will depend upon some kind of VALUE JUDGMENT. Different individuals will tend to give different answers according to their personal taste or ... | opinion<br>preference<br>choice |
| 10 Let's be perfectly clear about this distinction between (a) statements based on positive knowledge and (b) statements based on a value judgment. Here is a statement: 'Birmingham is a bigger city than Bath'. Which is it, (a) or (b)? | (a) |
| 11 How about this statement? - 'Keats is a greater poet than Byron'. (a) or (b)? | (b) |
| 12. Many people may agree that Keats *is* the greater poet, but it is not based how, if at all, the truth of the statement can be proved. No one can be pos.... about it. | positive |
| 13 Again, one of these is NOT a statement of positive knowledge: (a) God is Love. (b) Many people believe in the Love of God. Which? | (a) |
| 14 No amount of factual information can save the statement, 'God is Love' from being arguable. For the same reason, literary critics may be inclined to ... when it comes to deciding whether Keats is a greater poet than Byron. | argue<br>disagree |
| ...... | |
| 19 To make a value judgment is to form an opinion. Everyone, we say, is entitled to his own .... | opinion |
| 20 But all opinions are not equally worthwhile. When it comes to a clash between informed and uninformed opinion we can be sure that the (former/latter) is not to be trusted. | latter |
| 21 The connoisseur of wines can tell a choice vintage by its flavour: his palate is refined because he has learned to recognize the *criteria* by which reliable *standards* of comparison can be made. The tyro cannot tell one vintage from another because he does not know what the c... are and therefore has no .... of comparison. | criteria<br>standards |
| 22 Learning to appreciate good poetry is like learning to appreciate good wine. It is an axquired t... | taste |
| ..... | |
| 25 'Wine? Never touch the stuff myself. Give me beer every time.' Poetry? Utter bunk if you ask me' These are the kind of opinions often expressed. They are certainly not in.... opinions. | informed |
| 26 Such opinions are literally worthless. Only by taking into consideration *all* the relevant evidence is it possible to make a reliable estimate of the worth of anything. To make a reliable estimate of the worth of anything is to form a sound v... j... | value<br>judgment |
| 27 Think of it this way: the worth of anything needs to be estimated in terms of its .... rather than its *quantity*. | quality |
| 28 Quantity can be *measured* accurately, and to that extent our knowledge may be said to be *objective.*(ie. impersonal). Quality, on the other hand, has to be *judged* and to that extent our appraisal of it may be said to be sub... (ie. per...) | subjective<br>personal |
| ..... | |

36. Basically, each line contains 5 iambic feet. In an iambic
foot the accent is placed firmly on the (first/second) syllable. second

37. The metre (='measure') used in the English sonnet is known
as IAMBIC PENTAMETER. Each line contains ... iambic feet. 5
Only one of the following, therefore, could occur in a sonnet:
(a) The fair breeze blew, the white foam flew.
(b) When I consider how my light is spent.
(c) O young Lochinvar is come out of the West. Which? (b)

.....

56. We referred to this as the classical form because this was the form adopted in Italy where the first sonnets were written in the thirteenth century. From now on we shall call it the PETRARCHAN form (after the poet Petrarch, whose love-poems to Laura followed this pattern). In the Petrarchan sonnet, there is a clearly marked pause, or v... between the .... and the ....
volta
octave
sestet

57. The Petrarchan sonnet uses ... different rhymes in the octave and ... different rhymes in the sestet. 2,3

58. Using the letters a-e, write down the formula (i.e. the rhyming scheme) for a Petrarchan sonnet ....
abba abba"cde cde
abba abba"cdd ece, etc.

59. Now take a look at example No.2 on page 229 ('On his blindness'). Write down the formula for its rhyming scheme as before.
abba abba"cde cde
The rhyming scheme follows the classical or P.... pattern Petrarchan

## Part II

238 6. Sonnets 10 and 11 were both written by William Wordsworth (1770-1850). Both deal with much the same theme as 'London, 1802' - the decadence of Britain. One refers to England, the other to Scotland. Despite its being the work of a major poet, one of these is a bad egg. Find the dud, then turn to page 251.
(the two poems are printed on pages 245 and 246)

251 6. 'The pibroch's note, discountenanced or mute'. This is one of Wordsworth's later sonnets, and just about his worst. It is singularly lacking in inspiration and never gets off the goound.
252 The octave is halting and the sestet lacks any conviction. In l.4 the simile for the target 'mouldering like ungathered fruit' is unlovely. In ll.12-13 the inversions, 'Survives imagination - to the change Superior' are quite dreadful. As for l.13 - 'Superior? Help to virtue does she give?' the less said about it the better. 'The world is too much with us,' on the other hand, represents W at his best. This time, instead of sounding merely peevish, the poet's moral indignation fairly seethes and boils over - 'Great God! I'd rather be a pagan'... Incidentally you will find this one quoted in Fowler's English Usage as a typical Petrarchan sonnet. It seems that it would be more correctly classified as belonging to the Miltonic type. Do you agree?

## CONCLUSION

Whether tapes are programmed for use in the broadcast or library types of language laboratory, the prime essential is that their author first determine precisely what his objectives are. Information such as lexical meanings of the foreign language vocabulary, the sense conveyed by various sentence patterns or intonational patterns, the significance of morphological structures, the elements of literary forms can be taught through any of a number of programme formats. Linear programmes whether systematised according to a ruleg, egrule or conversational chaining model all seem appropriate for the teaching of indisputable facts which the student has to recall. Appropriate use of prompting, vanishing of prompts, and the cyclical reintroduction of previously learnt material to make sure it is retained have been demonstrated by experiment to be effective tools of instruction. Given that programmed instruction is designed for use in relatively short sequences commensurate with the student's span of attention, the use of a variety of approaches can serve the very useful purpose of diminishing the pall effect induced by excessive use of any novel technique. A set of mathetical exercises certainly promises to be more concise than a conventional Skinnerian sequence but the use of this technique has so far been almost exclusively limited to written programmes which might well need slight modification for use in the language laboratory. The operant span of the student confronted with a written text is apt to be longer than that of the listener concentrating on foreign language utterances in a laboratory.

Linear programmes appear particularly suited for the teaching of discriminations and generalizations. Thus work involving the recognition and production of foreign language phonemes and grammatical utterances would appear to demand a linear approach unless library facilities are available. Intrinsic programming techniques, as indeed any form of adaptive programming, certainly require at least a special tape-recorder for each student. Given the tendency of magnetic tape to stretch, the tape-recorder would need to be fitted with some device other than a tape counter to record the position of branching sequences on the tape. Remedial instruction is particularly easy to give whether the programme is intrinsic or adjunctive in format and while theoreticians of linear and mathetical programming consider such instruction should never be necessary, every teacher is aware that each of his students is capable of error and even of misapprenhension which only special tuition can dispel.

Listening comprehension can effectively be trained by adjunctive or mathetical approaches, but always on the presupposition that prerequisite knowledge has been mastered elsewhere. The depth to which comprehension can be pushed tends to be underrated by available programmes and the writer appends a comprehension programme of his own as evidence that the student can be assisted to appreciate some of the literary merit of a work when working with an adjunctive format. That the same can be done effectively through other techniques is the burden of the preceding chapter. There is no claim that lectures and tutorial discussions will be superseded by language laboratory programmes, but simply that in the study of literary style such programmes can make a unique contribution to the preparation of a worth-while seminar.

Existing programmes tend to go to either of two extremes: many are thrown together without sufficient preparation, method or testing, others manifest fear of departing from a methodology or making assertions capable of being questioned. The remedy is to bring a more eclectic attitude to programme writing. Given a detailed prospectus of what is to be taught and to what purpose, the programmer uses the technique best suited to the task. This is fundamental to the Mathetic outlook. The student working with a programme should bring to it the same critical approach as he would to his textbooks, lectures and seminars. There is no reason to imagine that the programmer will be infallible despite all the scrupulous care he brings to his work. It is important that a programme should be as free from error as is humanly possible, but there is no reason why it should not open up a subject to a student and express opinions with which he can be invited to agree or not. Every programme benefits from being field-tested and modified to suit the needs of the group of students for whom it is being used. Every programme which fails to realize its objectives and does not allow students to use the knowledge and skills it teaches independently of itself needs to be revised until it serves these ends.

An efficient programme for the language laboratory can be used and reused indefinitely in the conditions for which it was created. Programmes designed expressly for a supervised broadcast laboratory will always depend in part on the contribution of a sufficiently trained monitor. Integrated with a language teaching curriculum, the laboratory programme can make a unique contribution to a student's academic performance. Treated as an optional extra, language laboratory programmes can only achieve the very limited objectives for which they are designed. They are not a magic formula to allow lazy pupils to learn a foreign language without working, but, used as intended to elicit student responses to significant material, they have been shown by experiment to achieve their purpose.

# STUDENT SHEET

## APOLLINAIRE: IL Y A

During the tape, keep only the questionnaire in front of your eyes. Later, you may use the typescript if you cannot cope otherwise, but since the tape is intended primarily for listening comprehension, you should try

i) simply to understand what you hear
ii) to understand and to recall the verses of the poem for repetition.
iii) to understand and to recall the information to answer questionnaire.

Since a wide variety of answers is acceptable in most instances, no attempt is made to give anything more than a possible answer in each case. Should you disagree, so much the better, but see if you can express your reasons.

## QUESTIONNAIRE

1. Qui est Guillaume Apollinaire?
2. De quoi parle-t-il dans Il y a?
3. Quel est le vaisseau dont parle Apollinaire?
4. Quels sont les asticots dont parle Apollinaire?
5. Pourquoi donc les appelle-t-il des asticots?
6. Pourquoi dit-il naîtraient et non pas naissent?
7. Quelle est l'atmosphère du poème?
8. Quels sont les boyaux de Nietzsche, de Goethe et de Cologne?
9. Y a-t-il un développement linéaire dans le poème?

THINK ABOUT:

10. Est-ce qu'Apollinaire se limite au champ de bataille?
11. Comment décrire le poème?
12. Quelle importance attachez-vous au dernier verset?
13. Reconnaissez-vous une espèce de symbolisme dans l'art de l'invisibilité?

## TEXT OF TAPE

1. Musique introductoire.

2. Écoutez: Guillaume Apollinaire était officier dans l'armée française en 1915. Il a rencontré Madeleine Plagès qui rentrait en Algérie et dont il a appris l'adresse. Il lui a écrit des lettres à partir du mois d'avril et au mois de juillet il a commencé à le faire tous les jours. Après une permission passée avec elle au mois d'août, il regrette de la voir rentrer en Algérie. Voici sa lettre:

3. Il y a un vaisseau qui a emporté ma bien-aimée
Il y a dans le ciel six saucisses pareilles à des asticots dont il naît les étoiles
Il y a un sous-marin ennemi qui en voulait à mon amour
Il y a mille petits sapins brisés par les éclats d'obus autour de moi
Il y a un fantassin qui passe aveuglé par les gaz asphyxiants
Il y a que nous avons tout haché dans les boyaux de Nietzsche de Goethe et de Cologne
Il y a que je languis après une lettre de Madeleine
Il y a dans mon porte-cartes plusieurs photos de mon amour
Il y a les prisonniers qui passent la mine inquiète
Il y a une jeune fille qui pense à moi à Oran
Il y a une batterie dont les servants s'agitent autour des pièces
Il y a le vaguemestre qui arrive au trot par le chemin de l'Arbre isolé
Il y a dit-on un espion qui rôde par ici invisible comme le bleu horizon dont il est vêtu
Il y a Vénus qui s'est embarquée nue dans un havre de la mer jolie pour Cythère
Il y a les cheveux noirs de mon amour
Il y a dressé comme un lys le buste de mon amour
Il y a des Americains qui font un négoce atroce de notre or
Il y a un capitaine qui attend avec anxiété les communications de la T S F sur l'Atlantique
Il y a à minuit des soldats qui scient des planches pour les cercueils
Il y a des femmes qui demandent du maïs à grands cris devant un Christ sanglant à Mexico
Il y a le Gulf Stream qui est si tiède et si bienfaisant
Il y a un cimetière plein de croix à 5 kilomètres
Il y a des croix partout de ci de là
Il y a des figues de Barbarie sur les cactus en Algérie
Il y a les longues mains souples de mon amour
Il y a un encrier que j'avais fait pour Madeleine
Il y a ma selle exposée à la pluie
Il y a les fleuves qui ne remontent pas leurs cours
Il y a l'amour qui m'entraîne avec douceur vers Madeleine
Il y avait un prisonnier boche qui portait sa mitrailleuse sur son dos

Il y a des hommes dans le monde qui n'ont jamais été à la guerre
Il y a des Hindous qui regardent avec étonnement les campagnes occidentales
Il y a des femmes qui apprennent l'allemand dans les régions occupées
Elles pensent avec mélancolie à ceux dont elles se demandent si elles les reverront
Et par-dessus tout il y a le soleil de notre amour.

4. *Quelques-uns des mots demandent un éclaircissement*:

Le vaisseau dont parle Apollinaire est le navire qui remporte sa Madeleine en Algérie. Pendant la guerre, les sous-marins allemands menaçaient les navires qui traversaient la Méditerranée. Loin au-dessus de la terre, des ballons captifs flottaient pour permettre aux Français de faire l'observation. En bas se rangeaient les soldats des deux camps, et les fantassins de l'infanterie se battaient dans les tranchées contre un ennemi invisible. Ces tranchées communiquaient les unes avec les autres par moyen des cheminements qu'on appelait "boyaux". Comme dans toutes les guerres, des espions étaient chargés d'apprendre les secrets de l'ennemi et il fallait se méfier de tout inconnu, même du vaguemestre qui apportait son courrier. Pour ajouter à la confusion, il y avait une succession interminable d'éclats d'obus et l'inconvénient de la présence du gaz asphyxiant. Le camouflage, les tranchées, l'ennemi invisible - tout prêtait à cette première guerre mondiale, un atmosphère extrêmement sinistre et angoisseux.

5. En 1918, Guillaume Apollinaire a préparé un second recueil de ses poèmes, et a légèrement retouché son ancienne lettre. Depuis 1916, il renonce a tout mariage à cause d'une blessure à la tête. Pendant la lecture du texte, faites attention aux changements indiqués. Après la lecture, vous l'imiterez, verset par verset.

### IL Y A

Il y a un vaisseau qui a emporté ma bien-aimée
Il y a dans le ciel six saucisses *et la nuit venant on dirait* des asticots dont *naîtraient* les étoiles
Il y a un sous-marin ennemi qui en voulait à mon amour
Il y a mille petits sapins brisés par les éclats d'obus autour de moi
Il y a un fantassin qui passe aveuglé par les gaz asphyxiant
Il y a que nous avons tout haché dans les boyaux de Nietzsche de Goethe et de Cologne
Il y a que je languis après une lettre *qui tarde*
Il y a dans mon porte-cartes plusieurs photos de mon amour
Il y a les prisonniers qui passent la mine inquiète (omission
Il y a une batterie dont les servants s'agitent autour des pièces
Il y a le vaguemestre qui arrive au trot par le chemin de l'Arbre isolé

Il y a dit-on un espion qui rôde par ici invisible comme l'horizon dont il s'est indignement revêtu et avec quoi il se confond (omission)
Il y a dressé comme un lys le buste de mon amour (omission)
Il y a un capitaine qui attend avec anxiété les communications de la T S F sur l'Atlantique
Il y a à minuit des soldats qui scient des planches pour les cercueils
Il y a des femmes qui demandent du maïs à grands cris devant un Christ sanglant à Mexico
Il y a le Gulf Stream qui est si tiède et si bienfaisant
Il y a un cimetière plein de crois à 5 kilomètres
Il y a des croix partout de ci de là
Il y a des figues de Barbarie sur ces cactus en Algérie
Il y a les longues mains souples de mon amour
Il y a un encrier que j'avais fait dans une fusée de 15 centimètres et qu'on a pas laissé partir
Il y a ma selle exposée à la pluie
Il y a les fleuves qui ne remontent pas leur cours
Il y a l'amour qui m'entraîne avec douceur (omission)
Il y avait un prisonnier boche qui portait sa mitrailleuse sur son dos
Il y a des hommes dans le monde qui n'ont jamais été à la guerre
Il y a des Hindous qui regardent avec etonnement les campagnes occidentales (omission)
Ils pensent avec mélancolie à ceux dont ils se demandent s'ils les reverront
Car on a poussé très loin durant cette guerre l'art de l'invisibilité

Faites enregistrer et le texte que vous entendrez et votre imitation
(lecture du poème verset par verset, laissant des blancs)

6. Compréhension: vous entendrez des questions. Dans le blanc qui les suivra faites enregistrer vos réponses. Elles seront suivies d'une des réponses possib que vous répéterez, tout en faisant la comparaison avec votre propre réponse.

Notez: asticot - larve de la mouche
obus - projectile creux rempli d'une substance explosive
fantassin - soldat d'infanterie
vaguemestre - sous-officier changé de la distribution des lettres
espion - celui qui se mèle parmi les ennemis pour les observer
figues de Barbarie - fruit du cactus (prickly pear)
fusée - pièce de feu d'artifice (rocket)
mitrailleuse - arme à feu automatique

## WHAT YOU HEARD ON THE TAPE

1. C'est un officier de l'armée francaise, célèbre aujourd'hui comme poète.
2. Il parle de sa bien-aimée qui vient de le quitter.
3. C'est le navire qui remporte Madeleine - sa bien aimée - en Algérie
4. Ce sont des ballons captifs qui flottaient en l'air pour permettre aux Français de faire des observations.
5. Parce qu'ils ressemblent à la larve de la mouche.
6. Le conditionnel est plus vague et exprime une opinion, non pas un fait.
7. Celle de la peur et du regret.
8. Ce sont les tranchées allemandes communiquant entre elles par des chemins tortueux.
9. Non, les idées se développent par cycles.
10. Non, il évoque des situations très différentes dans le monde.
11. C'est une série d'images et d'idées qui passent par la tête d'un soldat épris de sa bien-aimée.
12. Quelle importance attachez-vous au dernier verset?
    Il pousse aux limites le côté sinistre du poème.
13. L'idée relie la disparition de Madeleine avec l'art du camouflage et du carnage.

## BIBLIOGRAPHICAL DETAILS OF WORKS CITED IN THIS THESIS

CROWDER, NORMAN A., *The Concept of Automatic Tutoring*, 1955, abstracted by Fry, Bryan and Rigney, "Teaching Machines, an Annotated Bibliography," *AV Communication Review*, 8, 1960, in part III, pages 18ff.

CROWDER, NORMAN A., "Intrinsic Programing: Facts, Fallacies, and Future", in Filep, Robert T. (ed), *Prospectives in Programing*, NY, Macmillan 1963, page 87.

PRESSEY, SIDNEY L., "Development and Appraisal of Devices Providing Immediate Automatic Scoring of Objective Tests and Concomitant Self-Instruction", *Journal of Psychology*, 29, (1950), as reedited for Lumsdaine and Glaser (eds) *Teaching Machines and Programmed Learning*, Washington, NEA, 1960, pages 69-88.

PRESSEY, SIDNEY L., "A Simple Apparatus which gives Tests and Scores - and Teaches". *School and Society*, 23, (1926), No. 586, reprinted in Lumsdaine and Glaser (eds.), *Teaching Machines and Programmed Instruction*, Washington, NEA, 1960, pages 35-41.

SKINNER, BURRHUS, FREDERICK, "The Science of Learning and the Art of Teaching", *Harvard Educational Review*, (1954), *reprinted in his Cumulative Record*, NY, Appleton Century Crofts, 1959, enlarged edition 1961.

STACK, EDWARD M., *The Language Laboratory and Modern Language Teaching*, NY, Oxford University Press, 1960. 2nd Edition 1965.

VAN ABBÉ DEREK, "Audio-lingual methods in Modern Language Teaching", in Brian Dutton (ed); *A Guide to Modern Language Teaching Methods*, London, Longmans, 1965.

WIENER, N, *Cybernetics*, Cambridge Mass., Technology Press of M.I.T. (1949), 2 ed. (1961), *Human Use of Human Beings*, Boston (1950), 2 ed. (1954),
PASK, GORDON, Adaptive Teaching with Adaptive Machines. article reprinted in Lumsdaine and Glaser (eds) *Teaching Machines and Programmed Instruction*, Washington, NEA, 1960, pages 349-366.

# CHAPTER I: SPECIFYING EDUCATIONAL OBJECTIVES FOR LANGUAGE LABORATORY PROGRAMMING, EVALUATION OF PERFORMANCE, AND THE RELEVANT LINGUISTIC THEORY

The Victorian Universities and Schools Examinations Board, Directions And Prescriptions, Melbourne, 1966.

Monash University Faculty of Arts, Handbook, Clayton, 1966.

University of Tasmania, Matriculation Manual, Hobart, 1966.

Scottish Educztion Department, Secondary Education, Edinburgh, HMSO, 1962.

BELASCO, SIMON, "Structural Drill and the Refinement Principle", Gravit and Valdman (eds), Structural Drill and the Language Laboratory, Bloomington, IJAL, 1963.

BISHOP, G. REGINALD, Editorial, Culture in Language Learning, Northeast Conference on the Teaching of Foreign Languages, 1960.

BLOOM, BENJAMIN S. et al., Taxonomy of Educational Objectives, I: The Cognitive Domain. NY, McKay, 1956, II Affective Domain, NY, McKay, 1964.

BROOKS, NELSON, "Learning a Modern Foreign Language for Communication",Seymour L. Flaxman (ed) Modern Language Teaching in School and College, Northeast Conference on the Teaching of Foreign Languages, 1961.

CARROLL, JOHN BISSELL, Language and Thought, Englewood Cliffs, Prentice-Hall, 1964.

CHOMSKY, NOAM, Syntactic Structures, The Hague, Mouton, 1957.

FREEMAN, STEPHEN A et al., "Study Abroad", in G. Reginald Bishop (ed): Foreign Language Teaching: Challenges to the Profession, Northeast Conference on the Teaching of Foreign Languages, 1965.

FRIEDL, ERNESTINE, "An Anthropological Concept of Culture" in G. Reginal Bishop, (ed): Culture in Language Learning Northeast Conference on the Teaching of Foreign Languages, 1960.

HARRIS, JULIAN, Teacher's Manual for Basic Conversation French, NY, Holt, Rinehart and Winston, 3 ed. 1963.

HOCKETT, CHARLES F., A Course in Modern Linguistics, NY, Macmillan, 1958.

LADO, ROBERT, Language Testing: the Construction and Use of Foreign Language Tests, Longmans, London, 1961.

LAMERAND, Raymond Jean, "The Language Laboratory and the Study of Literature", Babel, New Series, Vol 2, 1966, pp. 22-25, published by MLTAV, Victoria.

MACKEY, WILLIAM FRANCIS, Language Teaching Analysis, London, Longmans, 1965

MARTY, FERNAND, Programming a Basic Foreign Language Course, Vermont, Hollins College, 1962.

NIDA, EUGENE A., Morphology, the Descriptive Analysis of Words, Ann Arbor, 1949, University of Michigan Press.

NIDA, EUGENE A., Toward a Science of Translating, Leiden, Brill, 1964.

POLITZER, ROBERT L, Teaching French, an Introduction to Applied Linguistics, New York, Blaisdell, 2ed. 1965.

RIVERS, WILGA, MARIE, The Psychologist and the Foreign Language Teacher, Chicago, University of Chicago Press, 1964.

SCHERER, GEORGE A.C. and WERTHEIMER, MICHAEL, A Psycholinguistic Experiment in Foreign-Language Teaching, NY, McGraw Hill, 1964.

SKINNER, BURRHUS FREDERIC, Verbal Behavior, NY, Appleton-Century-Crofts, 1957.

STOLUROW, L.M., A Comparative Study of Methods of Programming Materials for Efficient Learning in Self-Instructional Devices, Urbana, 1961.

WEST, MICHAEL P., "Learning English as Behaviour", English Language Teaching, XIV, 1960.

## CHAPTER II: SKINNER'S LINEAR PROGRAMMING

A.C.E.R. Catalogue of Programmes in the Library, 10.4.1964. Melbourne, page 5.

AMSEL, ABRAM. "Error Responses and Reinforcement Schedules in Self-Instructional Devices" in Lumsdaine and Glaser (eds), Teaching Machines and Programmed Instruction, Washington, 506-516, NEA 1960.

ANGELL GEORGE W. and LUMSDAINE ARTHUR.A."Prompted Plus Unprompted Trials versus Prompted Trials Alone in Paired Associate Learning", Pittsburgh. (1960, abstracted in Lumsdaine and Glaser (eds) TMPI, page 582.

ANGELL DAVID and LUMSDAINE ARTHUR A. Retention of Material Presented by Autoinstructional Programs which Vanish and Which Do Not Vanish Verbal Cues, Palo Alto, (1962).

CARROLL, JOHN B. "Primer of Programmed Instruction in Foreign Language Teaching", International Review of Applied Linguistics in Language.Teaching, I, (1963), pages 115 - 141.

COULSON, JOHN E. and SILBERMAN, HARRY F. "Effects of Three Variables in a Teaching Machine", Journal of Educational Psychology, 51, (1960), pages 135 ff, also summarily reported in their: "Automated Teaching and Individual Differences", AV Communication Review 9, (1961), reprinted in Wendell I. Smith and J. William Moore: Programmed Learning, Princeton, NJ, (1962), page 207-217

CHOMSKY NOAM, "A Review of B. F. Skinner's Verbal Behavior", Language, 35, (1959), page 30, rp Jerry A. Fodor and Jerrold J. Katz (eds), The Structure of Language, Englewood Cliffs, Prentice Hall (1964), page 547-578.

COOK JOHN OLIVER and KENDLER TRACY S. "A Theoretical Model to Explain Some Paired-Associate Learning Data", in G. Finch and F. Cameron (eds) Symposium on Air Force Human Engineering, Personnel and Training Research, Washington, National Academy of Sciences.

EVANS, JOHN L., GLASER ROBERT, and HOMME, LLOYD E. "A Preliminary Investigation of Variation in the Properties of Verbal Learning Sequences of the 'Teaching Machine' Type", in Lumsdaine and Glaser (eds), Teaching Machines and Programmed Learning, Washington, (1960), pages 445-451.

HAYES, ET AL. "A New Look at Learning", in William F. Bottiglia (ed) Current Issues in Language Teaching, Northeast Conference on the Teaching of Foreign Languages 1962, pages 19 - 60.

HILGARD, ERNEST R. *Theories of Learning*, NY, Appleton-Century- Crofts. (1948. 2 ed. 1958) .

HILGARD, ERNEST R. *Introduction to Psychology*, NY, Appleton-Century-Crofts, NY, (1953, 2ed 1957)

LANE, HARLAN. "Programmed Learning of a Second Language", *International Review of Applied Linguistics in Language Teaching*, II, (1964), pages 249-301.

HOLLAND, JAMES G. and SKINNER, BURRHUS F. *The Analysis of Behavior*, NY. McGraw-Hill (1961).

KELLER, F. S. and SCHOENFELD, W. N. *Principles of Psychology*, NY, Appleton-Century-Crofts, 1950.

LANE, HARLAN. "Acquisition and Transfer in Auditory Discrimination". *American Journal of Psychology*, 77, (1964), pages 245ff.

LANE, HARLAN. "Methods for Self-shaping Echoic Behavior", *Modern Language Journal* 47 (1963) page 160.

LORGE, SARAH, "Language Laboratory Research Studies in New York City High Schools: A Discussion of the Program and the Findings", *Modern Language Journal*, 48 (1964), page 414.

LUMSDAINE, ARTHUR A., "Some Issues Concerning Devices and Programs for Automated Learning", in Lumsdaine and Glaser, *Teaching Machines andProgrammed Learning*, Washington, NEA,1960

MARGOLIUS, GARRY J, SHEFFIELD, FRED. "Optimum Methods of Combining Practice with Filmed Demonstration in Teaching Complex Response Sequences: Serial Learning of a Mechanical Assembly Task", in Lumsdaine, Arthur A., Symposium on Programmed Instruction, Washington, DAVI, pages 33 - 54.

NIDA, EUGENE. *Toward a Science of Translating*, Leiden, Brill, 1964.

POLITZER, ROBERT L. *Teaching French: An Introduction to Applied Linguistics*, NY Blaisdell, 1960, 2 ed. 1965,

RIVERS, WILGA MARIE. "The Colorado Experiment in Audio-Lingual Teaching", *Babel*, N.S, 1, (1965), page 19. Published by MLTA, Victoria.

RIVERS, WILGA MARIE. *The Psychologist and the Foreign Language Teacher*, Chicago, University of Chicago Press, 1964.

PIMSLEUR, PAUL. "Discrimination Training in the Teaching of French Pronunciation", Modern Language Journal, 47, (1963), page 203.

PIMSLEUR, PAUL, MACE, LARRY, KEISLAR, EVAN R., "Effect of Preliminary Training in Pronunciation Discrimination upon Learning of French Pronunciation with Recording Devices", Washington, (1961), abstracted by Keislar in Howard Lee Nostrand: Research on Language Teaching, Seattle, 1961, 2ed 1965., Washington University Press, page 288.

SCHERER, GEORGE A. C. and WERTHEIMER, MICHAEL. A Psycholinguistic Experiment in Foreign-Language Teaching, NY, Mc.Graw-Hill, 1964..

SKINNER, BURRHUS, F. "Are theories of learning necessary?" Psychological Review. 57 (1950) pp 193-216 Cumulative Record 39 - 69. Appleton-Century-Crofts, 1959, enlarged edition, 1961.

* SKINNER, BURRHUS, F. The Behavior of Organisms: an Experimental Analysis. Appleton-Century-Crofts, NY, 1938.

SKINNER, B. "Comments on'The Impact of Advancing Technology on methods in Education'by Dr. Simon Ramo", American Psychologist, 14 (1959), abstracted TMPI, page 685.

SKINNER, BURRHUS F. "The Control of Human Behavior", Transactions of the N.Y. Academy of Sciences, Series II 17 (My 1955) 7, pp 547-557, abridged rp. Cumulative Record, pp 18 - 23.

SKINNER, BURRHUS F. "The experimental analysis of behavior" American Scientist, 45, (S 1957) 343-371. Cumulative Record 100 -113.

SKINNER, BURRHUS F. Final report to Human Resources Research Office O 1957, abstracted TMPL, pp 683 - 4.

SKINNER, BURRHUS F. "Freedom and the Control of Men", The American Scholar, Winter 1955-1956, "The Human Situation Today", Cumulative Record pp 3 - 18.

SKINNER, BURRHUS F. "The generic nature of the concepts of stimulus and response", Journal of General Psychology, 12 (1935) pp 40-65, Cumulative Record pp 347-366.

SKINNER, BURRHUS F. "Operant Behavior", American Psychologist, 18, (1963), pages 509, 512.

SKINNER, BURRHUS F. Programming verbal knowledge for automated instruction in schools and colleges, read at symposium on automation of teaching. American Psychological Association Convention, Ag 1958 Washington, abstracted TMPL., p 684.

SKINNER, BURRHUS F. "The Programming of Verbal Knowledge" Galanter, Eugene, Automatic Teaching, the State of the Art NY. Wiley, 1959, abstracted TMPI, pp 685-6.

SKINNER, BURRHUS F. "Reflections on a decade of teaching machines", Teachers' College Record, 65, (N 1963), pages 168-177.

SKINNER, BURRHUS F. "Reinforcement today", American Psychologist, 13, (1958), pp 94-99, Cumulative Record, pp 131-141.

SKINNER, BURRHUS, F. "Reply to question in inside opinion", Programed Instruction, 1, (1961), 1.

SKINNER, BURRHUS, F. Report on the development of methods of preparing materials for teaching machines, report to HumRRO, abridged TMPI, pp 681-2.

SKINNER, BURRHUS F. Science and Human Behavior, NY, Macmillan, 1953.

SKINNER, BURRHUS F. "The Science of Learning and the Art of Teaching", Harvard Educational Review, 24, (1954), pp 86 - 97, eds. A. A. Lumsdaine and R. Glaser; Teaching Machines and Programmed Learning, Washington, D.C. 1960, Pp. 99-113. Cumulative Record, pp 145-157, Programmed Learning, 18 - 33.

SKINNER, BURRHUS, F. and MORSE, W. H. "A second type of "Superstition" in the Pigeon", The American Journal of Psychology, 70, (1957), pp 308-311, Cumulative Record pp 409-412.

SKINNER, BURRHUS F. "Some contributions of an experimental analysis of behavior to psychology as a whole". American Psychologist, 8, (F 1953), pp 69-78.

SKINNER, BURRHUS F. Something Good Happens to a Child Phi Delta Kappan, 42, (19[illegible]) pages 27ff.

SKINNER, BURRHUS F. "Special problems in programming language instruction for teaching machines", Oinas, F. J. (ed), Language Teaching Today, International Journal of American Linguistics, 26, (1960), pp 167-174, abstracted TMPI, p 686.

SKINNER, BURRHUS F. "Superstition in the Pigeon," J. exp. Psychol., 38, pp 168-172, Cumulative Record, pp 404-409.

SKINNER, BURRHUS F. "Teaching Machines", Science, 128, (1958), pp. 969-977, Lumsdaine and Glaser (eds) TMPI, pp 137-58, Cumulative Record 158-197.

SKINNER, BURRHUS F. "Teaching Machines", Scientific American, Vol. 205, (N 1961), pp 90-102.

SKINNER, BURRHUS F. "The theory behind teaching machines", Journal of the American Society of Training Directors, Jy 1961.

SKINNER, BURRHUS F. Verbal Behaviour, NY, Appleton-Century-Crofts, 1957.

SKINNER, BURRHUS F. "Why we need teaching machines", Harvard Educational Review, 31, (Fall 1961) 388, Cumulative Record, NY, Appleton-Century-Crofts, 1961, pp182.01-182.22 rp Alfred de Grazia, Programs, Teachers and Machines NY, Bantam, 1964, pp 43-66. John P. DeCecco, Educational Technology, NY, Holt, Rinehart & Winston, 1964.pp. 92-112

SKINNER, BURRHUS F. and HOLLAND, J. G. "The Use of Teaching Machines and Programmed Learning, eds, A. A. Lumsdaine and R. Glaser, TMPL, Washington, pp 159-72.

SMITH, WENDELL I. and MOORE, J. WILLIAM, "Size of Step and Cueing", Psychological Reports, 10, (1962), reprinted in their Programmed Learning, Princeton, NJ, 1962, Van Nostrand, pages 202-206.

VALDMAN, ALBERT. "Toward a Redefinition of Teacher Role and Teaching Context in Foreign Language Instruction", Modern Language Journal, 48, (1964), page 282.

WEISS WALTER, MACCOBY NATHAN, SHEFFIELD FREDD. "Combining Practice with Demonstration in Teaching Complex Sequences: Serial Learning of a Geometric-Construction Task" in Arthur A. Lumsdaine (ed): Student Response in Programed Instruction, Washington, (1961), pages 55-76.

WEST, MICHAEL D. "Learning English as Behaviour", English Language Teaching, XV, (1960).

## CHAPTER III: INTRINSIC PROGRAMMING

BRANSON, ROBERT K, "Some Pitfalls in the Classroom Use of Programs", Ofiesh and Meierhenry (eds), *Trends in Programmed Instruction*, Washington, DAVI, 1964, pages 78-79.

BRETHOWER, DALE M, *Programed Instruction: a manual of programing techniques*, Chicago, Educational Methods Inc., 1963.

ALTER, MILLICENT and ROBERT SILVERMAN, "The Response in Programed Instruction", *Journal of Programed Instruction*, I, (1962), pages 55-78.

CHALLINOR, K, "A Comparison of Multiple-Choice and Constructed-Response Programming of Four Spelling Rules", *Programmed Learning*, I, (1964), pages 60-68.

COULSON, JOHN E. and SILBERMAN, HARRY F. "Effects of Three Variables in a Teaching Machine", *Journal of Educational Psychology*, 51, (1960), pp 135-143.

CROWDER, NORMAN A., "Intrinsic Programming: Facts, Fallacies, and Future", (the initial part of which was first published as "The Rationale of Intrinsic Programming", in *Programed Instruction*, I, (1961), No. 5), Robert T. Filep (ed), *Prospectives in Programming*, NY, Macmillan, 1963, pages 85-115.

CROWDER, NORMAN A., "On the Differences between Linear and Intrinsic Programming", *Phi Delta Kappan*, 44, (Mr 1963), pp 250-254 reprinted Alfred de Grazia: (ed): *Programs, Teachers and Machines*. NY, Bantam, 1964, pages 77-85.

CROWDER, NORMAN A, "Programmed Instruction compared with Automated Instruction", in Ofeish and Meierhenry (eds): *Trends in Programmed Instruction*, Washington, DAVI, 1964, pages 28-30.

CROWDER, NORMAN A., "Automatic Tutoring by Intrinsic Programming", in Lumsdaine and Glaser (eds): *Teaching Machines and Programmed Learning*, Washington, D.C., 1960, pages 286-298.

CUMMINGS, ALLANA and LEOS GOLDSTEIN, *The Effect of Overt and Covert Responding on Two Kinds of Learning Tasks*, NY, 1962.

ELGEN, LEWIS and MARGULIES, STUART, "Response Characteristics as a Function of Information Level", Journal of Programmed Instruction, II, (1963), page 45.

GALANTER, EUGENE, "The Ideal Teacher", in Galanter, E. (ed), Automatic Teaching: the State of the Art, NY, Wiley, 1959, pages 1 - 11.

HILGARD, ERNEST, R, Theories of Learning, NY, Appleton Century-Crofts, 1948, 2 ed 1958.

HUNT, H.A.K., Practice Lessons on Dependent Clauses in Intermediate Latin, Melbourne, ACER, 1963, Volumes I - V.

HUGHES, JOHN L., "Effect of Changes in Programed Text Format and Reduction of Classroom Time on the Achievement and Attitude of Industrial Trainees", Journal of Programed Instruction, 1, (1962), pp 43-54.

KEISLAR, EVAN R and JOHN D. McNEIL, "A Comparison of Two Response Modes in an Autoinstructional Program with Children in the Primary Grades", Journal of Educational Psychology, 53, (1962), pages 127-131.

KRUMBOLTZ, JOHN D. and WEISMAN, RONALD G., "The Effect of Overt vs Covert Responding to Programed Instruction on Immediate and Delayed Retention", Journal of Educational Psychology, 53, (1962), pages 89-92.

LAMBERT, PHILIP, MILLER, DONALD M. and WILEY DAVID E. "Experimental Folklore and Experimentation: The Study of Programed Learning in the Wauwatosa Public Schools", Journal of Educational Research, 55, (1962), pages 485-494.

MAGUIRE, WILLIAM J, Audience Participation and Audiovisual Instruction: Overt-Covert Responding and Rate of Presentation" in Arthur A. Lumsdaine, Student Response in Programmed Instruction, Washington, National Academy of Sciences, 1961, pages 417-428.

MARKLE, SUSAN MEYER, EIGEN, LEWIS D., KOMOSKI, P. KENNETH. A programed Primer on Programing, NY, Center for Programed Instruction, 1960, 2 Volumes

MARKLE, SUSAN MEYER. Words: a Programmed Course in Vocabulary Development, Chicago, SRA, 1962.

RICHMOND, W. KENNETH. Teachers and Machines, London, Collins, 1965.

SENTER, R., NEIBERG, A., ABMA, J. S., MORGAN, R. L. "An Evaluation of Branching and Motivational Phrases in a Scrambled Book", Programmed Learning, I, (1964), pages 124 - 133.

SIDOWSKI, JOSEPH, KOPSTEIN, FELIX F. and ISABEL J., SHILLESTEAD. "Prompting and Confirmation Variables in Verbal Learning", Psychological Reports, 8, (1961), pages 401-406.

SILBERMAN, HARRY F., MELARAGNO, RALPH J., COULSON, JOHN E., ESTAVAN, DONALD. "Fixed Sequence versus Branching Auto-instructional Methods", Journal of Educational Psychology, 52, (1961), rp in John P. De Cecco (ed), Educational Technology, NY, Holt, Rinehart and Winston, 1964, pages 152 - 164.

SILVERMAN, ROBERT and MILLICENT ALTER. "Note of the Response in Teaching Machine Programs", Psychological Reports, 7, (1960), page 496.

STOLUROW, L. M. and WALKER, C. C. "A Comparison of Overt and Covert Response in Programed Learning", Journal of Educational Research, 55, (1962), pages 421 - 432.

TABER, JULIAN, GLASER, ROBERT and SCHAEFER, HOLMUTH H. Learning and Programmed Instruction, Reading, Massachusetts, Addison - Wesley, 1965, One of the most valuable of the manuals on Programmed Instruction.

## CHAPTER IV: ADJUNCTIVE PROGRAMMING

Lector - Specification folder, English Electric-Leo Computers.

BINDA, MARGARET CHURCHILL, Intensive Spoken French, Washington, English Language Services, 2 ed. 1962, 6 volumes.

BRIGGS, LESLIE J, "The Probable Role of Teaching Machines in Classroom Practice," Theory into Practice, 1, (1962), page 48

CARROLL, JOHN BISSELL, "A Primer ofProgrammed Instruction in Foreign Language Teaching", International Review of Applied Linguistics, 1 (1963), pages 115-141

CARROLL, JOHN BISSELL, Programmed self-Instruction in Mandarin Chinese: observations of student Progress with an Automated Audio-Visual Instructional Device, Wellesley, Massachusetts, 1963, ML Abstract, number 554, reprinted in Nostrand, Howard Lee et al., Research on Language Teaching, Seattle, Washington University Press, 1960, 2ed. 1965, page 60

COTÉ, DOMINIC, LÉVY, SYLVIA NARINS, O'CONNOR, PATRICIA, Le Français, Ecouter et Parler, NY, Holt, Rinehart and Winston, Teachers' Edition, 1962.

CROWDER, NORMAN A, "Automatic Tutoring by Means of Intrinsic Programming," in Galanter, Eugene, (ed), Automatic Teaching, the State of the Art, NY, Wiley, 1959, pp 109-116

GENTRY, CASS and VLCEK, CHARLES,Key Research in the Field of Programed Instruction, mimeo,

GOLDSTEIN, LEO S, Research in Programed Instruction, An Overview, NY, Center for Programed Instruction, 1963.

HARRIS, JULIAN and LÉVÊQUE, ANDRÉ, Basic Conversational French NY, Harcourt, Brace and World, 3ed. 1962.

HINES, SISTER THÉRÈSE and WELCH, EDWARD J, Our Latin Heritage, NY, Harcourt, Brace, and World, 2 volumes, 1962.

HOPE, QUENTIN M, Spoken French in Review, NY, Macmillan, 1963.

JONES, R.S., "Integration of Instructional with Self-Scoring Measuring Procedures," Abstracts of Doctoral Dissertations, 65, (1954), pages 157-165

LENARD, Yvone, Parole et Pensée, NY, Harper and Row, 1965.

KNELLER, JOHN W, GRUBBS, HENRY A, BARENBAUM, SIMON, Initiation au Français, NY, Macmillan, 1963.

OSGOOD, CHARLES E, Method and Theory in Experimental Psychology, NY, Oxford University Press, 1953.

PARKER, DON, Instructor's Handbook, Reading Laboratory IVa, Chicago, S.R.A., 1959.

PRESSEY, SIDNEY L, "Basic Unresolved Teaching-Machine Problems," Theory into Practice, 1, (1962), pages 30-37. Condensed version. Education Digest, 27 (1962) pages 1-3.

PRESSEY, Sidney L, "Certain major psycho-educational issues appearing in the conference on teaching machines", GALANTER, EUGENE (ed), *Automatic Teaching, The State of the Art*, NY, Wiley, 1959, pp. 187-198, abstracted *TMPL*, p.675.

PRESSEY, Sidney L, "Development and Appraisal of Devices providing immediate Automatic sorting of Objective tests and concomitant self-instruction", *J Psychol*, 29, (1950), 417-447, reprinted *TMPL*, pp. 69-88, reprinted *Programmed Learning*, pp.111-149.

PRESSEY, Sidney L, "Further attempts to develop a mechanical teacher (abstracts in *American Psychologist*, 1, (1946), p.7, abstracted, *TMPL*, p.676.

PRESSEY, Sidney L, "A Machine for Automatic Teaching of Drill Material", *School and Society*, 25, (1927), pp. 549-552, reprinted TMPL, pp. 42-46.

PRESSEY, Sidney L, "A Simple apparatus which gives tests and scores - and teaches", *School and Society*, 23 (1926), pp. 373-376, reprinted TMPL, pp. 35-41.

PRESSEY, SidneyL, "Some history regarding self-instructional devices read at Symposium on automation of teaching American Psychological Association Convention," Washington, DC, 1958, abstracted *TMPL*, pp. 674-675.

PRESSEY, Sidney L, "Some perspectives and major problems regarding teaching machines", Lumsdaine, Arthur A. and Glaser, Robert, *Teaching Machines and Programmed Learning*, Washington, NEA, 1960, pp. 497-505.

PRESSEY, Sidney L, "Teaching machine (& learning theory) crisis, *Journal of Applied Psychology*, 47, (1963), p.1-6, reprinted de Cecco abridged (1964) pp. 446-457, reprinted de Grazia, *PTAM*, pp. 33-42.

PRESSEY, Sidney L., "A Third and Fourth Contribution: toward the coming Industrial Revolution in Education", *School and Society*, 36 (1932), pp. 668-672, reprinted *TMPL*, pp.47-51.

RICHMOND, W. Kenneth, *Teachers and Machines*, London, Collins, 1965.

RIVERS, Wilga Marie, *The Psychologist and the Foreign Language Teacher*, Chicago, University of Chicago Press, 1964.

ROE, Arnold, et al, *Automated Teaching Methods Using Linear Programs*, Los Angeles, 1960, 57 pages, also ROE, Arnold, "Automated Teaching Methods Using Linear Programs", *Journal of Psychology*, 40 (1962), pp. 198-204.

SCHRAMM, Wilbur, *The Research on Programed Instruction*, Washington, US Office of Education, 1964, 112 pages.

SKINNER, Burrhus F., "Teaching Machines", *Science*, 128 (1958), pp. 970-971, reprinted in his *Cumulative Record*, pp. 170-171.

STACK, Edward M., *The Language Laboratory and Modern Language Teaching*, NY, Oxford University Press, 1960.

STANKUNAVICIUS, Stasys A., "Dr. Hollerith's Technique", *Lab-Talk*, (Journal of S.T.A. Victoria), No.8, (1965), pages 4 and 5.

STEPHENS, A.L., "Certain Special Factors Involved in the Law of Effect", *Abstracts of Doctoral Dissertations*, No. 64 (1953), pp. 89-93.

ZACCARIA, Michael A, and ADAMS, Charles F., "Adjunct Programming". in Ofiesh and Meierhenry (eds), *Trends in Programmed Instruction*, Washington, DAVI, 1964, pages 180-181.

## CHAPTER V: MATHETICS AND THE LANGUAGE LABORATORY

ASHER, JAMES, J. "Evidence for 'Genuine' One-trial Learning", *International Review of Applied Linguistics in Language Teaching*, I, (1963), pages 98-103.

BELASCO, SIMON. "Structural Drills and the Refinement Principle", in Gravit and Valdman (eds), *Structural Drill and the Language Laboratory*. Bloomington, IJAL (1963), pages 24-25.

BARLOW, JOHN. "Conversational Chaining in Teaching Machine Programs", *Psychological Reports*, 7, (1960), page 188.

CARROLL, JOHN BISSELL. "A Primer of Programmed Instruction in Foreign Language Teaching", *International Review of Applied Linguistics in Language Teaching*, I, (1963), pages 115-141.

CÔTE et al. *Le Français, Ecouter et Parler*, NY, Holt, Rinehart & Winston, 1962, Teacher's Edition.

GILBERT, THOMAS F. An Early Approximation to Principles of Programming continuous discourse. Self-Instructional Materials. Murray Hill, N.J., Bell Laboratories, Mimeo 1958. Abstracted TMPL pp 629-634.

* GILBERT, THOMAS F. "Lessons that teach,"read at the APA Meeting, NY, 1961.

GILBERT, THOMAS F. "Mathetics: the technology of education" *Journal of Mathetics*. 1 (1962) 7-73.

* GILBERT, THOMAS F. "Mathetics II: The Design of Teaching Exercises", *Journal of Mathetics*, 1 (1962) 2.

GILBERT, T. F. "On the relevance of laboratory investigation of learning to self-instructional programing", Lumsdaine & Glaser, *Teaching Machines and Programmed Learning*, pp 475-485.

GILBERT, THOMAS F. "Some Issues Involved in Selecting an Automated Teaching Device". Bell Telephone Laboratories, Murray Hill, N.J., September, 1958. (Mimeo) abstracted TMPL, page 634.

* GILBERT, THOMAS F. Some recent attempts at the partial automation of teaching (mimeo), report to the Uni of Georgia, 1958, abstracted TMPL 635-6.

GILBERT, THOMAS F. "Reinforcement of Perception", *American Journal of Psychology*, 60, (1947), pages 119-124.

BROOKS, NELSON. *Language and Language Learning*, NY, Harcourt, Brace and World, (2ed. 1960).

CARROLL, JOHN BISSELL. *Programmed Self-Instruction in Mandarin Chinese: Observations of student progress with an automated audio-visual instructional device*, Wellesley, Massachusetts, (1963), abstracted in *ML Abstracts* number 554, reprinted in Mostrand et al, *Research in Language Teaching*, Seattle, (2ed 1965), page 60.

CHERRY, *On Human Communication*, NY, M.I.T. Press, 1957, reprint Wiley, 1961.

HARLOW, H.F. & M.K. and Meyer, "Learning Motivated by a Manipuation Drive", *J.Experimental Psych*40(1950) pp228-234.

LADO, ROBERT. *Language Teaching, A Scientific Approach* NY, McGraw-Hill, 1964.

LOE, SISTER BARBARA. *Immediate Memory Span in English and Chinese Sentences of Increasing Length*, unpublished M.S. thesis at Georgetown University, (1964), cited by Lado, Robert, in "Memory Span as a Factor in Second Language Learning", *International Review of Applied Linguistics in Language Teaching*, III, (1965), page 127.

MARTY, FERNAND. *Linguistics Applied to the Beginning French*. Roanoke, Virginia, 1963.

MARKLE, SUSAN MEYER. Good Frames and Bad - a Grammar of Frame Writing, NJ. Wiley, 1964.

McGAULLEY, M. T. "Mathetics in Industrial and Vocational Training", abstract 29 of papers presented at the National Programmed Learning Conference, Loughborough. 1966. *Programmed Learning*, 3, (1966), page 115.

OSGOOD, CHARLES E., SUCI, GEORGE J, and TANNENBAUM, PERCY H. *The Measurement of Meaning*, Urbana, 1957.

PRESSEY, SIDNEY L. "Some Perspectives and Major Problems Regarding 'Teaching Machines'", in Lumsdaine and Glaser (eds): *Teaching Machines and Programmed Instruction*, NEA, Washington, 1960, pages 497-505.

RIVERS, WILGA MARIE. "Listening Comprehension", *Modern Language Journal*, 50, (1966), pages 196-204.

RIVERS, WILGA MARIE. *The Psychologist and the Foreign Language Teacher*, Chicago, University of Chicago Press. 1964.

SKINNER, BURRHUS F. Verbal Behavior. NY. Appleton-Century-Crofts, 1957,

STACK, EDWARD M. The Language Laboratory and Modern Language Teaching, NY. Oxford University Press, 1960.

TABER, JULIAN I., GLASER, ROBERT and SCHAEFFER, HALMUTH H. in Learning and Programmed Instruction, Reading, Massachusetts, Addison-Wesley, 1965.

VALDMAN, ALBERT with BELASCO, SIMON (ed). French, an introduction to Applied Linguistics, Boston, Heath, 1961.

## CHAPTER VI: IDIOMORPHIC PROGRAMMING

ANNETT, JOHN, "Teaching Machines in Industrial and Military Training", Kenneth Austwick (ed): *Teaching Machines and Programming*, Exford, Pergamon, pages 43-78.

COULSON, JOHN E et al., "Computer-Based Instructional Systems", Margulies and Eigen (eds), *Applied Programmed Instruction*, NY, Wiley, 1962, pages 106-119.

CROWDER, NORMAN L., "Simple ways to use the Student Response for Program Control", presented at the Conference on Application of Digital Computers to Automated Instruction, October 10-12, 1961, Washington, U.S. Industries, Inc.

FINN, JAMES D., "Technological Development: Its Meaning for Education in the 1970's", Robert T. Filep (ed): *Prospectives in Programing*, NY, Macmillan, 1963, page 199.

LEWIS, B.N., "The Rationale of Adaptive Teaching Machines", Maurice Goldsmith (ed), *Mechanisation in the Classroom*, London, Souvenir Press, 1963, pages 85-119.

LEWIS, B.N. and PASK, GORDON, "The Development of Communication Skills under Adaptively Controlled Conditions", *Programmed Learning*, I, 1964, pages 69-88.

PRESSEY, SIDNEY, L. "A Simple Apparatus Which Gives Tests and Scores - and Teaches", School and Society, 23, (1926), reprinted in Lumsdaine and Glaser (eds): *Teaching* Machines and Programmed Learning, Washington, NEA, 1960, pages 35-41.

RICHMOND, W. KENNETH, *Teachers and Machines*, London, Coltins, 1965.

SIME, MAX "The Elements of the Teaching System" in Goldsmith: *Mechanisation in the Classroom*, London Souvenir Press, 1963, pages 113-135.

STOLUROW, LAWRENCE M. "A Model and Cybernetic System for Research on the Teaching-Learning Process", *Programmed Learning*, 2 (1965), page 142.

## CHAPTER VII: PROGRAMMING FOR THE LANGUAGE LABORATORY

BARRUTIA, Richard, "A Suggested Automated Branch Program for Foreign Languages", Hispania, 47, (1964), pages 342-350.

BRIGGS, Leslie J. et al., "Self-pacing versus Automatic Pacing in Paired-Associate Learning", in Lumsdaine, Arthur (ed) Student Response in Programed Instruction, Washington, National Academy of Sciences, pp. 399-410.

BROWN,J, LEWIS,R, HARCLEROAD,F, AV Instruction: Materials and Methods, NY, 1959, 2ed. 1964, Mc Graw-Hill.

BORGLUM, George, "What is the A-V score now?", in Oinas, Felix J. (ed): Language Teaching Today, in International Journal of American Linguistics, 26 (1960), part II, pp. 199-2

BUNG, Klaus, Subvalidation of Language Programmes, (mimeo), London, 1965, Presented to Association of Programmed Learning Conference at Loughborough, 1966.

CARROLL, John Bissell, "A Primer of Programmed Instruction in Foreign Language Teaching", International Review of Applied Linguistics in Language Teaching, I, (1963), page 115-141.

CONNOR, David V., "The Two Faces of Programmed Instruction", The Teachers' Journal, 48, (1965), page 451.

CROWDER, Norman A., "Intrinsic Programing: Facts, Fallacies and Future", in Filep, Robert (ed): Prospectives in Programing, NY, Macmillan, 1963, pages 84-115.

FELDHUSEN, John F. and BIRT, Andrew, "A Study of Nine Methods of Presentation of Programed Learning Material", Journal of Educational Research, 55, (1962), pages 461-466

FRYE, Charles H., "Group vs Individual Pacing in Programed Instruction", abstracted Schramm, Wilbur , The Research on Programmed Instruction, Washington, US Office of Education, 1964.

GAARDER, A. Bruce, "Language Laboratory Techniques: the Teacher and the Language Laboratory", in Oinas, Felix J. (ed): Language Teaching Today in International Journal of American Linguistics, 26, (1960), pages 41-50.

GILBERT, Thomas F., "On the Relevance of Laboratory Investigati of Learning to Self-Instructional Programming", (1959), reprin in Lumsdaine and Glaser (eds): TMPL, Washington, DAVI, 1960, pp. 475-485.

GROPPER, George L., and LUMSDAINE, A.A. "An Experimental Comparison of a Conventional TV Lesson with a Programed TV Lesson Requiring Active Student Response. Studies in Televised Instruction, Report no. 2." Pittsburgh, 1961 - abstract given in Schramm: The Research on Programmed Instruction, Washington, US Office of Education, 1964, pages 56-57.

HARRIS, Julian and LÉVÊQUE, Andre: Basic Conversational French, NY, Holt, Rinehart and Winston, 3ed, 1964.

IISON,R.F., "The Dicto-Comp: "A Specialized Technique for Controlling Speech and Writing in Language Learning", Language Learning, 12, (1963), pages 299-301.

KRONES, , SAWYER, , and GROSJEAN: "On the Use of Low-Frequency Tones for Marking Language Laboratory Tapes", Language Learning, 14, (1964), pages 51-54.

LADO, Robert, "Memory Span as a Factor in Second Language Learning", International Review of Applied Linguistics in Language Learning, 3 , (1965), pages 123-129.

LAMÊRAND, Raymond Jean, "The Language Laboratory and the Study of Literature", Babel, N.S., 2, (1966), pages 22-25.

LAMÊRAND, Raymond Jean, "Efficient Language Learning", a paper on intensive courses of instruction with particular reference to the R.A.A.F. School of Languages at Point Cook, submitted for publication in the Australian Journal of Education.

MARTY, Fernand, L., Programing a Basic Foreign Language Course: Prospects for Self-Instruction, Vermont, Hollins College, 1962.

MARTY, Fernand, L., Linguistics Applied to the Beginning French Course, Roanoke, Virginia, Audio-Visual Publications, 1963.

MATHIEU, Gustave, "One Answer to Advanced Lab Work", Modern Language Journal, 44, (1960), pages 354ff.

MUELLER, Theodore, and NIEDZIELSKI, Henri, "Programmed Instruction in Teacher Retraining (NDEA Institutes)", Modern Language Journal, 50, (1966), pages 92-97.

O'NEAL, Robert, "My Aunt's Pen", Modern Language Journal, 47, (1963), pages 29-30.

PENNINGTON, D.F., and SLACK, C.W., "The Mathetical Design of Effective Lessons", in Margulies, Stuart, and Eigen, Lewis D., (eds): Applied Programed Instruction, NY, 1962,

ROSSELOT, La Velle, "Audio-aids Techniques in Foreign Language Teaching", Modern Language Journal, 33, (1949), pages 544-550.

SHEARER, G.A., "A New Look at Audio Programming", Programmed Instruction Bulletin, 1, (1966), no 2, pp. 16-12.

SIME, Max, "The Elements of a Teaching System", in Austwick, Kenneth (ed): Teaching Machines and Programming, Oxford, Pergamon, 1964, pp. 113-135.

THOMAS, C.A., DAVIES, I.K., OPENSHAW, D., and BIRD, J.B., Programmed Learning in Perspective, Barking, Essex, Lamson Technical Products, 1963.

THOMPSON, Mary P., "Writing in an Audio-Lingual Modern Foreign Language Program", in Teacher's Notebook, NY, (1965), abstract 913 in Mathieu, Gustave (ed): Modern Language Abstracts.

WIKSTROM, W.S., "Lessons in Listening", The Conference Board Record, 2, (1965), pp. 17-19.

## CHAPTER VIII: A PROGRAMMED COURSE IN FRENCH PHONETICS

ANGELL, David, LUMSDAINE, Arthur A., *Retention of Material Presented by Autoinstructional Programs which Vanish and which do not Vanish Verbal Cues*, Palo Alto, American Institute for Research, 1962.

BURROUGHS, Eliane, *A Programmed Course in French Phonetics*, Temac Programmed Learning Materials, Chicago, Encyclopaedia Britannica, 1961.

DELATTRE, Pierre C., *Advanced French Pronunciation*, Colorado, 1949, Script of Recordings.

DELATTRE, Pierre C., *Principes de Phonétique Française*, Vermont, Middlebury College, (2ed. 1951).

DURAND, Marguerite, *Voyelles longues et voyelles brèves*, 1946.

FOUCHÉ, Pierre, *Traitéde Prononciation française*, Paris, Klincksieck, 1956, 2ed 1959.

HANLEY, Theodore D., and THURMAN, Wayne L., *Developing Vocal Skills*, NY, Holt, Rinehart and Winston, 1962.

HOMME, Lloyd E., and GLASER, Robert, "Problems in Programming Verbal Learning Sequences", (1959), in Lumsdaine and Glaser (eds): *TMPL*, pp. 486-496.

GLASER, Robert and TABER, Julian I., "*Investigations of the Characteristics of Programed Learning Sequences*, Pittsburgh, University of Pittsburgh, 1961, Chapter 9 also published in the *Journal of Educational Research*, 53, (1962), pp. 508-512.

MAGER, Robert F., *Preparing Objectives for Programmed Instruction*, Palo Alto, Varian, Associates printed by Fearon Publishers, San Francisco, (1961), rp. as *Preparing Instructional Objectives*, Palo Alto, (1962).

ROTHKOPF, Ernst Z."Programed Self-Instructional Booklets, Mnemonic Phrases, and Unguided Study in the Acquisition of Equivalences", *Journal of Programed Instruction*, 1, (1962), pp. 19-28.

SIMON, Péla, "Films radiologiques des articulations et les aspects génétiques des sons du langage", *Orbis*, 10, (1961), pp. 45-68.

THOMAS, C.A., DAVIES, I.K., OPENSHAW, D. and BIRD, J.B., *Programmed Learning in Perspective*, Barking, Essex, Lamson Technical Products, 1963.

## CHAPTER IX: A LANGUAGE LABORATORY PROGRAMME FOR THE STUDY OF LITERATURE.

*Gateway to the Great Books*, Volume V, Encyclopaedia Britannica, Chicago, (1963).

*Great Books of the Western World*, Chicago, Adler and Cain, Encyclopaedia Britannica,(1962)

McLAUGHLIN, RITA E. and ELEY, EARLE J. *Literature Sampler* Secondary edition, Chicago, Encyclopaedia *Britannica, 1962.*

*Newsletter* of the M.L.A. Conference on the Language *Laboratory* and the Teaching of Literature, ed. Pleasants, Jeanne Varney.

S.R.A. *Pilot Library*, Chicago, S.R.A. 1962.

*FORME ET FOND*, L. C. Breunig, André Mesnard, Helen Carlson, Renée Geen, NY, The Macmillan Company, 1964.

BREUNIG,LEROY C., ANDRÈ MESNARD, HELEN CARLSON, RENÈE GEEN Script of Magnetic Tape to accompany *Forme Et Fond*, NY, Macmillan, 1964.

ENKRIST, NILS ERIC. "On Defining Style: an Essay in Applied Linguistics", in Spencer (ed), *Linguistics and Style*, London, Oxford University Press, *1964*, pages 3 - 56.

LÈON, PIERRE R. *Laboratoire de langues et correction phonétique*, Paris, *Didier*.

McLUHAN, H M., *Understanding Media*, NY, 1964.

MARKLE, SUSAN MEYER, *Good Frames and Bad*, NY, Wiley, 1964, page 97.

NIDA, EUGENE. *Learning a Foreign Language*, NY. Friendship Press, *1950.*

OGDEN, C. K. and RICHARDS, I. A. *The Meaning of Meaning*, Cambridge, (1923, 8ed 1946), rp., *NY, Harcourt Brace, 1965.*

OSGOOD, CHARLES E: SUCI, GEORGE J. and TANNENBAUM, PERCY H. *The Measurement of Meaning*, Urbana, Illinois, (1957).

REID, JAMES M; CIARDI, JOHN; PERRINE, LAURENCE. *Poetry a Closer Look*, Harcourt, Brace and World, NY, *(1963).* The first part by Reid occupies 37 pages; part II by Perrine is an eleven page lecturette on Rhythm and Meter; part III by Ciardi spends sixteen pages to discuss Metaphor in Poetry; part IV is a 50 page anthology furnished with short directives preceding each poem compiled by all three.

RICHMOND, W. KENNETH. *Teachers and Machines*, London, Collins. 1965.

# A BIBLIOGRAPHY
# ON TEACHING AND TESTING
# IN FOREIGN LANGUAGES

## With Special Reference to Programmed Learning

R. J. LAMERAND

# A BIBLIOGRAPHY

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## With Special Reference to Programmed Learning

R. J. LAMERAND

Typed at the Faculty of Education,
Monash University. 198 p.
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Research, Melbourne 1967.

# Preface

The presentation of this Bibliography is a co-operative effort. Mr. Lamerand, who was formerly a lecturer at Monash University and is now at the Centre Universitaire de Linguistique Appliquee at Neuchatel in Switzerland, explains its origin in his Introduction.

In the belief that if it were made more generally available the time of many students would be saved, and libraries would be helped, the Faculty of Education at Monash arranged for its typing from funds available to it, and the A.C.E.R. arranged for its duplication and distribution.

Copies have been presented to National, State, and University Libraries, to Schools of Education in the Universities, to State Education Departments, and to a limited number of other places in Australia and overseas.

A small reserve of copies of the Bibliography, to meet requests from other centres with a proved interest in research in teaching foreign languages, is held by the Faculty of Education at Monash University, and at A.C.E.R., but it is not intended for sale or more general distribution.

(W. C. Radford)
Director

February 1967.

# INTRODUCTION

This bibliography on programmed learning in theory and practice is the fruit of some years of work originally inspired by Fr. J. Casey, S.J., an outstanding educationalist. Lack of availability of books and periodicals in Australia prompted systematic annotation of their source when a copy was found in some library or other, either through inter-library loans or by searching the catalogues of libraries visited. Mr. R. Butler, librarian of the N.S.W. Department of Education Library, was particularly helpful with materials available in this very important collection of educational publications. It would be impossible to mention by name all the other people whose assistance led to the distribution of the information in the following pages, but it is certain nothing would have appeared at all but for the patient collaboration of my wife.

The abbreviations adopted are those of the Education Index firstly because of their general currency and secondly because they are at times more suggestive of a title than shorter ones of value only to the initiate. To condense this publication as much as possible TMPL replaces Teaching Machines and Programmed Learning, edited by A. Lumsdaine and R. Glaser (Washington, DAVI, 1961), IRAL International Review of Applied Linguistics in Language Teaching (Heidelberg, 1963+), RLT Research on Language Teaching 1945-1964 eds. H. Nostrand and others (Seattle, Uni.of Washington Press, 1965), SDLL Structural Drill and the Language Laboratory, eds. F. Gravit and A. Valdman (The Hague, Mouton, 1963) - also issued as Part III of IJAL (International Journal of American Linguistics) vol.XXIX (1963) no.2, PTAM, Programs, Teachers and Machines edited by W. Smith and Moore, NY, 1964.

It is unfortunate that D. Kausler's Readings in Verbal Learning, NY, Wiley, 1966 only came to the compiler's notice on reaching Switzerland as many theoretical papers particularly in Part Two of this work are of considerable importance to the main theme.

This bibliography incorporates the preparatory work for the author's M.A. thesis presented to Monash University entitled Some Approaches to Programming for the Language Laboratory with Proposals for Increasing Their Effectiveness. Comment, additions and discussion will always be welcomed by

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# METHODOLOGY OF RESEARCH

"Aims, methods, and materials of research in the Modern
Languages and Literatures," PMLA, LXVII (O 1952) 3-37.

BARZUN, Jacques and GRAFF, Henry F.,
The Modern Researcher, N.Y., Harcourt Brace & World, 1957.

CARPENTER, Clarence R.,
"A Theoretical orientation for instructional film research"
AV Communication Review, 1 (1953) 38-52.

CARROLL, John B.,
"Research on Teaching Foreign Languages", N. L. Gage (ed.),
Handbook of Research on Teaching, Chicago, 1963, pp. 1060-1100.

DELATTRE, Pierre,
"Research Techniques for Phonetic Comparison of Languages" in
International Review of Applied Linguistics, Vol.I, No.2,
1963, pp.85-97.

* FISHER, Ronald A.,
The Design of Experiments, London, Oliver & Boyd, 1947.

GOOD, Carter V.,
"Research methods bibliography: selected bibliography on the
methodology of educational, psychological and social research
1945-1946", Phi Delta Kappan XXVIII (Ja 1947) 210-215,
XXIX (N 1947) 146-152, XXX (S 1948) 19-26, XXXI (S 1949) 38-46,
XXXII (S 1950) 11-15, 18-22, XXXIII (S 1951) 45-52, 61.

* HAYES, Alfred S.,
A Tentative schematisation for research in the teaching of
cross-cultural communication (mimeo) Purdue Uni. Lafayette.Ind.
for conference on Materials and Techniques for the LL,March,
1961.

HAYES, Alfred S., NAJAM, Edward W.,
"A Tentative Schematization for Research in the Teaching of
Cross-cultural Communication", Materials and Techniques in the
LL conference,March 1961, IJAL 28 (1962) pp. 155-167.

LANE, Harlan L.,
"Experimentation in the Language Classroom: Guidelines and
suggested procedures for the classroom teacher" in Language
Learning,12(September 1962), pp. 115-121.

MUELLER, Klaus A., NAJAM, Edward W.,
"Experimentation and research in the development of Modern FL
materials ant teaching methods", Materials and Techniques in
the LL conference,March 1961, IJAL 28 (1962), pp. 92-104.

PIMSLEUR, Paul,
"Experimental design in the language field", Modern Language Forum, XLII (D 1957) 157-163.

WALSH, Donald D.,
"The Role of the NDEA", in Saturday Review, N.Y., 16 Feb. 1963, pp. 73-74.

* WARFEL, Harry R.
"Research projects and procedures in modern languages", Mod Lang AV Consultation, Wayne State Uni., 5 Dec., 1958.

# BILINGUALISM

Conference Internationale Sur Le Bilinguisme et L'Education: Bureau International d'Education, Geneve,(1928).

"Childhood and Second Language Learning": FL Bulletin 49 (1956) rp(1961), MLA NY.

"Report on the Experiment Involving the Use of the Second Language as a Medium of Instruction": Cape Town, Union of South Africa, Cape Educational Dept. (1952).

Bilingualism in the Secondary Schools in Wales, Great Britain Ministry of Education London HMSO 1949

AGARD, Frederick Browning, DUNKEL, Harold, "An Investigation of second-language Learning" Boston, (1948).

ANDERSSON, Theodore, "FLES and the Conservation of our Language Resources", Hispania, (1964) 47, pp. 593-596.

ANDERSSON, Theodore, "A New Focus on the Bilingual Child", Mod Lang J (1965) 49, pp. 156-160.

ANDERSSON, Theodore, "The Optimum Age for beginning the study of Modern Languages", Int R Ed (1960) pp. 298-306.

PEAL ~~[illegible]~~, Elizabeth ~~PEAL~~, "A comparison of the cognitive functioning of monolinguals and bilinguals (PhD thesis) McGill Uni, (1964).

PEAL ~~[illegible]~~ Elizabeth, ~~PEAL~~, LAMBERT, W.E., "The relation of bilingualism to intelligence" Psychological Monographs, 76 (1962).

ANISFELD, M., LAMBERT, W., "Social and psychological variables in learning Hebrew", J Ab Soc Psychol, 63 (1961) pp. 524-529.

ARSENIAN, Seth "Bilingualism in the Postwar World" Psycho B. Lancaster Pa NY ~~[illegible]~~), 42 (1945) pp. 65-86.

BOWEN, J. Donald, "Bilingualism, Ambilingualism, and Language Teaching", The Florida FL Reporter, 4, (1965-66) pp. 15, 18.

BOYER, Mildred V., "Texas Squanders Non-English Resources", Tex FLAssocB, (1963), pp.1-7.

CARROW, Sister Mary Arthur, "A Comparative Study of the Linguistic Functioning of Bilingual Spanish-American Children and Monolingual Anglo-American Children at the Third Grade Level"

Unpublished Ph.D. dissertation, Northwestern University (1956).

CARROW, Sister Mary Arthur, "Linguistic Functioning of Bilingual and Monolingual Children", J Speech & Hearing Dis,3(1957), pp. 371-80.

CARROW, Sister Mary Arthur, "Linguistic Functioning of Bilingual and Monolingual Children", J Speech & Hearing Dis 23(1967) pp. 371-380.

CHIASSON, R.J., "Bilingualism in the School of Eastern Nova Scotia" Unpublished Ph D. dissertation, University of London, (1950).

CHRISTIAN, Chester C. Jr., "The Acculturation of the Bilingual Child" Mod Lang J 49 (1965) pp. 160-165.

DARCY, Natalie, "The effect of bilingualism upon the measurement of the intelligence of children of pre-school age" J Ed Psychol 37 (1946) pp. 21-44.

DUNKEL, Harold B, AGARD, Frederick B., "Second-language Learning" Ginn, Boston, (1948).

ERVIN, Susan M., OSGOOD, C.E., "Second Language Learning and Bilingualism", C.E. Osgood & T.A. Sebeok (Eds.) Psycholinguistics: A survey of theory and research problems. J.abnorm.soc.Psychol. (1954) 49 (4, Part 2), pp. 139-146.

FISHER, John H., "The New Interrelation between first and second Language Learning", Report of surveys and studies in the Teaching of Modern Foreign Languages, pp. 277-280, MLA of America.

GAARDER, A. Bruce, "Conserving our Linguistic Resources", PMLA, 80 (1965) pp. 19-23.

GAARDER, A. Bruce, et al. "The Challenge of Bilingualism", Reginald Bishop, Jr. (ed.) Foreign Language Teaching: Challenges to the Profession, Reports of the Working Committees, Northeast Conference on the Teaching of Foreign Languages, (1965), pp. 54-101.

GAARDER, A. Bruce, "Teaching the Bilingual Child, Research, Development, and Policy", Mod Lang J, 49, (1965), pp. 165-175.

HALL, Robert A., Jr. "Bilingualism and Applied Linguistics", Zeitschrift für Phonetik und allgemeine Sprachwissenschaft, 6, (1952) pp. 13-30.

HAUGEN, Einar, "The Bilingual Individual", ed Saporta, Sol Psycholinguistics: A Book of Readings (1961), pp. 395-407.

HAUGEN, Einar I., Bilingualism in the Americas, University of Alabama, Publication 26 Amer. Dialect Society

HAUGEN, Einar I., "The Norwegian Language in America: A Study in Bilingual Behaviour", University of Pennsylvania Press, (1953) 2 vols

HUGHES, Marie Morrison, "The English Language Facility of Mexican-American Children Living and Attending School in a Segregated Community". Unpublished Ph.D. dissertation, Stanford University, (1952).

ILG, Frances L., GESSELL, Arnold, "Childhood and second language learning", FL B. 49, (1961).

JAKOBOWITS, L., LAMBERT, Wallace E., "Semantic satiation among bilinguals" J Exp.Psychol.62, (1961) pp. 576-589.

JENKINS, James J., RUSSELL, Wallace A., "Associative clustering during recall", J Ab & Soc. Psychol 62, (1952) pp. 818-821.

JENKINS, James J., and RUSSELL, Wallace A., "Associative clustering during Recall", *J Ab Soc Psychol*, 47 (1952) pp.818-821.

JENKINS, J. Clark, "Utilizing Community Resources to Improve the Teaching of Modern Foreign Languages in the Elementary School", *Calif J El Ed* (1961) pp.9[illegible]-100.

JOHNSON, Granville B. Jr., "Bilingualism as Measured by a Reaction-Time Technique and the Relationship between a Language and a Non-Language Intelligence Quotient", *Pedagogical Seminary and J Gen Psychol*, 82, (1953) pp.3-9.

JOLY, Charles L., *"A Comparison of the Performance of the Spanish-Speaking Bilingals on English and Spanish Forms of the of the Inter-American Tests of General Ability."* *U S Office Ed*, (1958-59)

JONES, W. R., "A critical study of bilingualism and nonverbal intelligence", *Brit J Ed Psychol*, 30, (1960) pp.71-76.

JONES, W.R., and STEWART, W.A.C., "Bilingualism and Verbal Intelligence," *Brit J Psychol* (Statistical Section), 4, (1951) pp.3-8.

JOOS, Martin, "The five clocks", *IJAL*, 28, (1962).

KESTON, M.J., and JIMENEZ, C., "Study of the Performance on English and Spanish Editions of the Stanford-Binet Intelligence Test by Spanish-American Children," *Pedagogical Seminary and J Gen Psychol*, 85, (1954), 263-69.

KRAMER, C.Y.,"Extension of multiple range tests to group correlation

LAMBERT, Wallace E., "Behavioural evidence for contrasting forms of Bilingualism", Georgetown Uni., *Round Table Meeting on Linguistics and Language Studies*, 12 (1961) pp.1-11.

LAMBERT, Wallace E., "Developmental aspects of second-language acquisition", *J Soc Psychol*, 43, (1956)p83-104.

LAMBERT, Wallace E., "Measurement of the Linguistic Dominance of Bilinguals," *J Ab Soc Psychol*, 50, (1955), pp.197-200.

LAMBERT, Wallace E., *et al*., "Attitudinal and cognitive aspects of intensive study of a second language", *J Ab Soc Psychol*, (1963).

LAMBERT, W. E., *et al*., "The Influence of Language-Acquisition Contexts on Bilingualism", *J Ab Soc Psychol*, 56, (1958) pp.239-244.

LAMBERT, W.E., *et al*., "Linguistic manifestations of bilingualism" , *Amer. J. Psychol*, 72, (1959), ~~pp.72~~, 77-82.

LAMBERT, Wallace E., and PEAL, Elizabeth, "The Relation of Bilingualism to Intelligence", *Amer Psychol A*, Washington (1962)

~~LAMBERT, Wallace E., and JAKOBOVITS, Leon A., "Semantic Satiation among Bilinguals. J Exp Psychol, 62 (1961) pp 576 589~~

LAMBERT, Wallace E, and FILLENBAUM, Samuel,"A Pilot study of aphasia among bilinguals", Can J Psychol, 13, ( 1959), pp28-34.

LARSEN, Dorothy E., "Arithemtic Drill in FLES", Mod Lang J, 45, (1961), pp.300-302.

LEOPOLD, Werner F., "Speech Development of a Bilingual Child" 4 vols., Evanston, Ill., Northwestern Uni. Press, (1939-49)

LEREA, L., and KOHUT, S.M., "A comparative study of monolinguals and bilinguals in a verbal task performance", J Clin Psych, 27, (1961) pp.49-52.

LEVENSON, Stanley, "A European Experiment in Interlingual Exchange, Mod Lang J, 46, (1962) pp. 272-273.

LEVINSON, B. M., "A Comparison of the performance of bilingual and monolingual native-born Jewish pre-school children of traditional parentage on four intelligence tests", J Clin Psych, 15 (1959), pp.74-76.

McCONKEY, W.G., "An Experiment in Bilingual Education", J Soc Res,2, (1951), pp.28-42.

McCORMICK, C.A., "Italian and Assimilation", Babel, 26, (1964) pp.2-4.

MA'IA'I, Fanaafi, "Bilingualism in Samoa: Its Problems and Implications for Education", Unpublished Ph.D. dissertation, Institute of Education, Uni. of London, n.d.

MALHERBE, E. G., "The Bilingual School: A Study of Bilingualism in South Africa", Johannesburg, Bilingual School Assocn (1943)
also London, Longmans, 2 ed 1946

METRAUX, Ruth W., "A Study of Bilingualism among Children of U.S.-French Parents", French R, 38, (1965) pp.650-665.

O'ROURKE, Everett V., "An Experiment in Integrating Biology and Spanish, Calif J Sec Ed, (1960), pp.427-36.

PERALES, Alonso M, "The Audio-Lingual Approach and the Spanish-Speaking Student", Hispania, 48, (1965), pp.99-102.

PIAGET, Jean, Le Langage et la pensée chez l'enfant, Delachaux et Niestlé, Paris, (1926) third ed. (1948)

PIMSLEUR, Paul, "Report of the Conference on Psychological Experiments related to second-language learning", Uni. Calif., Los Angeles, NDEA, (1959-60) 36pp.

POWELL, David R., Initial Clusters and the Spanish-Speaking Learner, Engl Lang Teach, (1962), pp.95-101.

ROJAS, Pauline M., Reading Materials for Bilingual Children", El Sch J, 47, (1946) pp.204-11.

RONJAT, Jules, Le Développement du langage observé chez un enfant bilingue, Champion, P. (1913)

SMITH, Madorah E, "Measurement of Vocabularies of Young Bilingual Children in Both of the Languages Used," J Gen Psych, 74 (1949), p.305-10.

SMITH, Madorah E., "Word Variety as a Measure of Bilingualism in Preschool Children", J Gen Psych, 90 (1957) pp.143-50.

SPOERL, Dorothy T, "The academic and verbal adjustment of college-age bilingual students", J Gen Psych, 64 (1944) pp.139-57

TAILLON, Leopold c.s.c., "Expressive Knowledge through Retroversion. The specific function of the mother tongue in productive teaching of a second language", Communication à l'ac
Hamilton (1962)

TAILLON, Leopold, c.s.c.,"Le séminar international sur le bilinguisme en éducation - Aberystwythe 1960 organisé par la Commission Nationale du Royaume-Uni pour l'Unesco en Collaboration avec l'Université du Pays de Galles." Editions de l'Atelier, Montreal, (1960)

TIREMAN, Lloyd S, and ZINTZ, Miles V., "Factors Influencing Learning a Second Language", Ed, (1961), pp.310-313.

WOOLSEY, A. Wallace, "What are we doing for the Spanish-Speaking Student?", Hispania, 44, (1961), pp.119-122.

WONDER, John P., "The Bilingual Mexican-American as a Potential Teacher of Spanish", Hispania, 48, (1965) pp.97-98.

## TESTING ACHIEVEMENT DIAGNOSTIC & PROGNOSTIC

Educational and Psychological Measurement 22 (1962); Iowa Every-Pupil Test of Basic Skills, Boston, Houghton Mifflin, new ed. 1940-1950; A Measure of Language: The Testing Phase,3M Co.

"The MLA'S Cooperative Classroom Testing Program", in The Mod Lang J, 47, (1963), p. 212.

ADAMS, Georgia (Wein) Sachs, in consultation with Theodore L. Torgerson, Measurement and Evaluation in Education, Psychology, and Guidance, New York, Holt Rinehart and Winston (1964).

ADKINS, D C , "Measurement in relation to the Ed Process", Ed and Psychological Measurement, 18 (1958), 221-240, *TMPI 581.

ANASTASI, Anne, Principles of Psychological Testing, NY, (1961).

ANASTASI, Anne, Psychological Testing, NY, 1954, 2ed 1961, Ch 4 "Norms, their nature and interpretation", Ch 6 "Test Validity. Good bibliog., Ch 5 "Test reliability", Ch 7 "Item Analysis"

ANDERSON, R C. "Role of Educational Engineer", bibliog f J Ed Sociol 34:377:81 Ap '61.

ANISFELD, Moshe, and LAMBERT, Wallace E. "Social and Psychological Variables in Learning Hebrew", J Abnormal Social Psychol, 63, (1961), pp. 524-529.

ANNET, John, "The Role of Knowledge of Results in Learning: a Survey", De Cecco, (1964), pp. 279-286 rp from technical report Navtradevcen US Naval Training Device Center 342-3, Port Washington NY.

*BARTZ, Albert E., Elementary Statistical Methods for Educational Measurement, Minneapolis, Burgess, 1958.

BAYLEY, Nancy, "Data on the growth of intelligence between 16 and 21 ys as measured by the Weschler-Bellevue Scale", J Genetical Psychol, 90 (1957).

*BEEZHOLD, F W. "Factor Analyses of Language Achievement Tests" J Nat Inst Personnel Res., Johannesburg, 1956, 6, 63-73.

BOHNING, Elizabeth E., "AATG Contest Examinations", German Q, 34, (1961), pp. 463-70.

BULLOCK, D H , MALINE, D B , "Diagnosing Child Behavior", Train Sch Bul, 55 (1958) pp. 47-53.

BUROS, Oscar Krisen, The Fifth Mental Measurements Yearbook, N.J., Gryphon Press, 1959.

CARROLL, Brendan J., "An English Language Survey in West Africa", Engl Lang Teach, 16, (1962), pp. 205-210.

CARROLL, John Bissell, "A Factor Analysis of two Foreign Language Aptitude Batteries", J Gen Psychol, 59, (1958), pp. 3-19.

CARROLL, J B., Notes on the Measurement of Achievement in Foreign Languages, Cambridge, Mass.: ~~Author~~, 1954.

CARROLL, J. B., "The Prediction of Success in Intensive Foreign Language Training", in Glaser, Robert (ed) Train Res and Ed, NY, Wiley (1962), pp. 87-136.

CARROLL, J B , "Use of the Modern Language Aptitude Test in Secondary Schools", Yearb. nat. counc. Meas. used in Educ., 16, (1959), pp. 155-159.

CARROLL, J. B., SAPON, Stanley M., "Modern Language Aptitude Test" MLAT Manual, NY, The Psychological Corporation, 1959.

CARROLL, J. B., SAPON, Stanley M., "Prediction of Success in a Work-Sample Course in Mandarin Chinese", American Psychologist, 10, (1955), pp. 492-493.

CARROLL, J. B., SAPON, Stanley M., RICHARDS, S E Construction and Validation of a Test Battery for Predicting Success in Spoken Language Courses, 1954.

CATTELL, R. B., Description and Measurement of Personality, NY, World Book Company, 1946.

CHABERT, H., "The MLA Language Tests", French R, 39, (1966),p.624.

CHEYDLEUR, F.D., & SCHENCK, Ethel A. From the ASTP forward: Standardized Test Results in Foreign Languages at the University of Wisconsin 1943-1949, Wis., Bull. Univer., 1950.

CHEYDLEUR, F D., & SCHENCK, Ethel A. Attainment Examinations in Foreign Languages, past, present, and future: Credits vs. Achievement at the University of Wisconsin 1931-1947, Wis., Bull. Univer., 1948.

CLOOS Robert I., "A Comparative Study of Fourteen Predictors of Success in the Audio-Lingual Approach to First-Year German at the High School Level", unpublished Ed.D. (1964), 105 pages.

CORNELL, F G , DAMRIN, D E , SAUPE, J L , CROWDER, N A , Proficiency of Q-24 Radar Mechanics III, the Tab Test - a Group Test of Troubleshooting Proficiency.Texas, ~~Glaser, Damrin & Gardner~~, 1954.

*CRONBACH, L J , Essentials of Psychological Testing, NY, Harper, 2ed 1960.

CROSS, K P , GAIER, E L , "Technique in Problem-Solving as a Predictor of Educational Achievement", J Ed Psychol, 46, (1955) pp. 194-206.

DAVIS, F B , "Item Analysis Data: Their Computation Interpretation, and Use in Test Construction", Harvard Education Papers no 2, Graduate School of Ed Harvard Uni, Cambridge, 1946, p. 42.

*DORCUS, R. M , MOUNT, G E., & JONES, Margaret H. Construction and Validation of Foreign Language Aptitude Tests, Los Angeles, Department of Psychology, Univer. of California, 1952.

DUFORT, Mary R. "An Audio-Comprehension Ability Test for FL Programs in the Elementary School", *Calif J El Ed*, 1961, pp. 121-128.

* DUFORT, Mary and SCHEVILL, Karl,"Foreign Language Cumulative Report Form", *Calif J for Instructional Improvement*, 7, (1964), pp. 16-17.

DYER, Henry S., "Validity of the German Placement Test", *Col Board R*, 1, (1947), pp. 24-26.

EATON, Esther M. "Evaluation and Testing in Teaching Modern Foreign Languages", *Sch Life*, 44, (1962), pp. 19-22.

EISNER, O, "Some Examination Papers Examined", LOWE, Margaret & John (eds.) *On Teaching FLs to Adults*, Oxf., Pergamon, 1965.

ENGELHART, Max D, LEWIS, Hugh B., "An Attempt to measure scientific thinking", *Ed & Psychol M*, 1, (1941), pp. 289-94.

FLANAGAN, John C. "Units, Scores and Norms", LINDQUIST, E.F.(ed) *Ed M*, Washington, American Council on Education, 1951.

FURST, Edward J, *Constructing Evaluation Instruments*, NY, Longmans, 1958.

HANNA, Sami A. "Quantitative Measurement of Errors in Reading Arabic", *Mod Lang J*, 48, (1964), pp. 349-352.

* HARMS, L. S. "Self-Instruction in Sound Discrimination and Phonetic Transcription", unpublished, (1962), pp. 1-18.

* HASCALL, Edward O., "Predicting Success in High School Foreign Language Study", *Personnel & Guid J*, 40, (1961), pp. 361-367.

HENMON, V A C , "Prognosis tests in the Mod Fls" pp. 3-31 BOHAN, John E., BRIGHAM, Carl C, HOPKINS, L. Thomas, RICE, George A., SYMONDS, Percival M., TODD, John W., VAN TASSEL, R. J. have other articles, *Publications of the American and Canadian Committee on Mod Ls*, 14, (1929)

* HENMON, V.A. C., "Recent Developments in the Construction, Evaluation, and Use of Tests in the Modern Foreign Languages", COLEMAN, A. (ed) *Experiments and Studies in Mod Lang Teaching*, Chicago, Univer. of Chicago Press, 1934, pp. 191-218.

INGRAM, Elisabeth, "Age and Language Learning", *ATML*, pp. 18-24.

JONES, Willis Knapp, "A Prognosis Test for Spanish", *Hispania*, 48, (1965), pp. 104-109.

* KAULFERS, W V. "Prognosis and its Alternatives in Relation to the Guidance of Students", *German Q*, 12 (1939), pp. 81-84.

KRAMER, C Y "Extension of Multiple Range Tests to Groups Correlated Adjusted Means", *Biometrics*, 13, (1957), pp.13-18.

KREUSLER, Abraham, "Measurement in FL in Soviet Schools", *Ky FL Q*, 8, (1961), pp. 191-198.

LADO, Robert, *Language Testing: the Construction and Use of Language Tests*, London, Longmans, 1961

LEDERER, Herbert, "Evaluating Advanced Placement Candidates: Notes from the Chief Reader's Desk", German Q, 38, (1965), pp. 506-513.

LEE, William R., "Grading (1)", Engl Lang Teach, 17, (1963), pp. 107-112.

* LEE, W.R., "Grading", Engl Lang Teach, 18, (1964), pp. 82-88.

LEUTENEGGER, Ralph R., "Auditory Factors and the Acquisition of French Language Mastery," Mod Lang J, 48, (1964), pp.141-146.

LEUTENEGGER, Ralph R., "Auditory Factors in Foreign Language Acquisition", Mod Lang J, 49, (1965), pp. 22-31.

* LIENERT, Gustav A., "Testaufbau und Testanalyse", published by Julius Beltz, Weinheim/Bergstrasse (Germany), 1961, pp.502.

* LUMSDAINE, Arthur A, ORR, D B , Preliminary Evaluative Studies of Science Telecasts, Pittsburgh, American Institute for Research, 1958.

McARDLE, Lois, "TOEFL: Program for the Testing of English as a Foreign Language", The Linguistic Reporter, 6 (1964), pp.2-3.

* MARGE, Michael, "A Factor Analysis of Oral Communication Skills in Older Children", J Speech and Hearing Res, 7, (1964), pp.31-46.

* MARQUARDT, William F. "Can Foreign Student Selection be Based on Aptitude for Learning English?", IIE News Bulletin (1961), pp.2-8.

MUELLER, Klaus A., "Correlation of Foreign Language Speaking Competency and Grades in Ten Midwestern Liberal Arts Colleges," Mod Lang J , 47, (1963), pp. 353-355.

MUELLER, Theodore, "Auding Tests", Mod Lang J, (1959), pp 185-187.

MURRAY, Henry A., Thematic Apperception Test Manual, Cambridge, Mass., Harvard University Press, 1943.

* NUNNALLY, J.C., FLAUGHER, R.L., and HODGES, W.F., "Measurement of Semantic Habits", Ed & Psychol M, 23, (1963), pp. 419-434.

OBUCHOWSKI, Chester W., "The Missing Link", Hispania, 46, (1963), pp. 609-612.

OTTER, H.S , "An Oral Proficiency Assessment Chart", Mod Lang, 46, (1965), pp 155-159.

PIMSLEUR, Paul, "Foreign Language Learning Ability", Georgetown Univ Monograph Series in Languages and Linguistics, 1961.

PIMSLEUR, Paul, "New Tests for a New Era", Audiovisual Instruction, 7, (1962), pp. 634-636.

PIMSLEUR, Paul, "The French Speaking Proficiency Test", NAJAM, Edward W, "Materials and Techniques in the LL rep 2nd LL Conference 23-25/3/1961", IJAL, 28, (1962), pp. 105-113.

PIMSLEUR, Paul, "Predicting Achievement in Foreign Language Learning", SDLL, (1963), 129-138; IJAL, 29, (1963), 2, part III.

PIMSLEUR, Paul, "Student Factors in Foreign Language Learning", *Mod Lang J*, 46, (1962), pp. 160-170.

POLITZER, Robert, "Auditory Discrimination of French Vowels by English Speakers", *Can J of Linguistics*, 6, (1961), pp. 32-44.

PORTER C.B , and EGGERS, J., "Teacher Constructed Tests", *Sch Shop* 22, (1962), pp. 18-19.

PRESSEY, S L., "Development and Appraisal of Devices Providing Immediate Automatic Scoring of Objective Tests and Concomitant Self-Instruction", *J Psychol.*, 29, (1950), pp. 417-447.

PRESSWOOD, William L., "Examinations and Oral Proficiency in Modern Languages", *Mod Lang*, 43, (1962), pp. 68-70.

RAND, Earl, "A Short Test of Oral English Proficiency", *Lang Learn*, 13, (1964), pp. 203-210.

SADNAVITCH, Joseph M., POPHAM, W. James, "Measurement of Spanish Achievement in the Elementary School", *Mod Lang J*, 45, (1961), pp. 297-299.

SCHEIDER, Rose M., "Evolution of the Listening Comprehension Test", *Col Board R*, (1962), pp. 24-28.

SHILLAN, David, "Fresh Thinking about Oral Examinations", *Engl Lang Teach*, 43, (1964), pp. 104-109.

SHROUD, J     B     , et al, "Correlation Analysis of WISC and Achievement Tests", *J Ed Psychol*, 48 (1957)

* SEVERIN, D.G. "Appraisal of Special Tests and Procedures used with Self-Scoring Instructional Testing Devices", *Abstr. Doctoral Dissertations*, 66, (1955), pp. 323-330.

SMITH, Nila B., "An Experiment to Determine the Effectiveness of Practice Tests in Teaching Beginning Reading", *J Ed Res*, 7 (1923), pp. 321-328.

STARR, W.H., "Competency first: New tests in Foreign Languages" CARROLL, J B (Ed.), *Proc. 1960 Invitational Conf. on Testing Problems*, Princeton, N J.: Educational Testing Service, 1961.

STARR, Wilmarth H., "Proficiency Tests in Modern Foreign Languages" *PMLA*,76(1961), pp. 7-11.

STEIN, Gisela, "An Evaluation of German Honors Projects at Brooklyn College: Their Operation and Effectiveness in Required Courses", *German Q*, (1961), pp. 58-64.

STRAIN, Jeris E., "Difficulties in Measuring Pronunciation Improvement", *Lang Learn*, 13, (1963), pp. 217-224.

STREVENS, Peter, "The Development of an Oral Test for West Africa", *Engl Lang Teach*, 15, (1960), pp. 17-24.

STROEBE, Lilian L., "Standardized Tests for Aural Comprehension", *Mod Lang*, (1945), pp. 146-147.

THARP, J B. "A Modern Language Test", J Higher Educ., 6, (1935), pp. 103-104.

THORNDIKE, R L , "Reliability" Ch 15, pp. 560-620, LINDQUIST, Everet Franklin, Educational Measurement, Washington, American Council on Education , 1951.

THORNDIKE, Robert Ladd, HAGEN, Elizabeth, Measurement and Evaluation in Psychology and Education, NY, Wiley, 1955, 1957.

TIFFANY, William, "Slurvian Translation as a Speech Research Tool" Speech Mon, 30, (1963), pp. 23-30.

* TRAVERS, R.M W. How to Make Achievement Tests, NY, Odyssey Press, 1950.

TRAXLER, A E , "Administering and Scoring the Objective Test"

UPSHUR, John A, "Language Proficiency Testing and the Contrastive Analysis Dilemma", Lang Learn, 12, (1962), pp. 123-127.

VALETTE, Rebecca M., "Oral Objective Testing in the Classroom", German Q, 38, (1965), pp. 179-187.

VALETTE, Rebecca M., "The Use of the Dictee in the French Language Classroom", Mod Lang J, 48, (1964), pp. 431-434.

VASU, Leon V., "Measurement of Fluency - Direct and Indirect", R. US Army Lang Sch, (1961), pp. 1-15.

VERNON, P E , Intelligence and Achievement Tests, London, Meth., 1960.

VERNON, Philip Ewart, The Measurement of Abilities, Uni of London Press, L 1940, 2rp 1949.

* VERNON, P E , The Measurement of Abilities, Uni of London, London, 1949.

VON WITTICH, Barbara, "Prediction of Success in Foreign Language Study", Mod Lang J, 46, (1962), pp. 208-212.

WILKINSON, Elizabeth M. and ROWLEY, Brian A, "Testing Candidates for a University Course in Language and Literature", Mod Lang, (1961), pp. 56-64.

* WOOD, Dorothy Adkins, Test Construction: Development and Inter--pretation of Achievement Tests, Columbus (Ohio), Merrill, 1961 2rp 1961.

PROGRAM WRITING

*COMMONWEALTH PUBLIC SERVICE BOARD*, Programmed Instruction Proceedings of a Training Officers' Workshop (1964).

*FIRST CONFERENCE OF LANGUAGE PROGRAMMERS*, An Arbor Michigan: Programming of Audio-lingual language skills for self-instructional presentation, (1961).

ABERCROMBIE, DAVID, "Conversation and Spoken Prose", *English Lang. Teaching*, 18, (1963), pp.10-16.

BARLOW, JOHN A., "Auto-instructional procedures for teaching facts, skills, and values in a General Psychology Course", *American Psychological Assocn. Meeting* (1961).

BARLOW, JOHN A., "Conversational Chaining in Teaching Machine Programs", *Psychological Reports*,7, (1960), pp.187-193.

BASESCU, BERNARD, "More on Multiple-Choice Frames", *Programmed Instruction*, 2, (1962), 1.

BASESCU, BERNARD, "On frames and on editing and revising PI", *PIP*, (1963).

BECK, JACOB, "On some methods of programming", Galanter, (ed.), *Automatic Teaching The State of the Art*, (1959), pp.55-62.

BECKER, J. L. "A Programmed Guide to Writing Auto-Instructional Programmes", *R.C.A. Educational Services*, (1964).

BRETHOWER, DALE. M. "Programmed Instruction and Programming Techniques", *Educational Methods, Inc*. (1964).

BROUGHTON, GEOFFREY, "An Early Oral Drill Technique", *English Language Teaching*, 19, (1965), pp.114-120.

CRAM, DAVID, *Explaining "Teaching Machines" and Programming*, Fearon Publishers, (1961).

CROWDER, NORMAN A. "Automatic tutoring", *Feedback*, 1, (1961), page 7.

CROWDER, N. A. "Automatic tutoring by means of intrinsic programming," *Proceedings of E.T.S. Invitational Conference*, (1959).

CROWDER, NORMAN A. "Automatic Tutoring by Means of Intrinsic Programming", *Automatic Teaching: The State of the Art*, ed. E. Galanter, (1959), pp.109-16.

EDGERTON, A. K. and TWOMBLY R. W. "A Programmed Course in Spelling", *The Elementary School Journal*, 62,(1962),pp.380-86.

EIGEN, LEWIS D. "The Construction of Frames of an Automated Teaching Program", *Articles of Programmed Instruction*, (1959), pp.9.

EVANS J. L. *Multiple choice discrimination programming*,American Psychological Assocn. (1961).

EVANS, J. L.; GLASER R. and HOMME, L. E. The Development and use of a 'standard' program of investigating prgrammed verbal learning, American Psychological Asscn. Chicago, (1960).

EVANS, J. L. GLASER, ROBERT; and HOMME, L. E. The RULEG System for the Construction of Programmed Verbal Learning Sequences, Uni. of Pittsburgh, Dept.PSych. (1960), J.Educ. Res., 55, (1962), pp.513-518.

FRY, E. B. "Programming Trends", Audiovisual Instruction, 6, (1961), pp.142-46.

GAGNE, R. M. and BROWN L. T. "Some factors in the prgramming of Conceptual Learning", Journal of Experimental Psychology, 62, (1961), pp.313-21.

GEIS, GEORGE, L. Program Preparation, Stamford, Conn: Public Service Research Inc. (1961).

GILBERT, THOMAS F. Some recent attempts at the partial automation of teaching, Report to Uni. of Georgia, (1958).

GILBERT, T. F. Some Issues Involved in Selecting an Automated Teaching Device , Bell Telephone Lab., Murray Hill, (1958). (Mimeo).

GILBERT, THOMAS F., "Mathetics: The Technology of Education", Journal of Mathetics, 1, (1962), pp.7-73.

GILBERT, THOMAS F., "Mathetics 2: The Design of Teaching Exercises", Journal of Mathetics, 1, (1962), 2.

GILBERT, T. F. "On the relevance of Laboratory Investigation of learning to self-instructional programming", Lumsdaine & Glaser (eds.), Teaching Machines and Programed Learning, pp.475-485, (1959).

GILBERT, THOMAS F., Lessons that Teach, Read at APA Meeting (1961).

GILBERT, THOMAS F. An Early Approximation of Principles of Programming Continuous-Discourse, Self-Instructional Materials, Murray Hill, N.J., Bell Laboratories, (1958), pp.629-634.

~~GILBERT, THOMAS F. "Mathetics: The Technology of Education I: The General System", TOR Education Inc. (1961).~~

GILBERT, THOMAS F., "An early approximation to principles of programming continuous discourse, self-instructional materials", Feierabend R.L. and Dubois, P.H. (eds.), Psychological problems and research methods in Mathematics training, Cooperative Research Project 642, (1959).

GLASER, R. "A Guide to the Preparation of Programmed Instruction Materials", Addison-Wesley, (1963).

GLASER, R. "Principles and Problems in the Preparation of Programmed Learning Sequences", University of Texas Symposium on the Automation of Instruction, (1960).

GOROW, F. F. "I Wrote a Scrambled Book", Audiovisual Instruction, 6, (1961), pp.136-37.

GREEN, EDWARD J. "A Technique for determining the densities of programs", AID, 1, (1961), p.27.

HILDEBRANDT BRUNO F. O. and HILDEBRANDT, LIESELOTTE M., "Drills in German Pronunciation", Pruett Press Inc., (1964).

HOK, RUTH, "Oral Exercises : Their Type and Form", MLJ, 48, (1964), pp.222-226.

HOMME, L. E. and GLASER R. "Problems in Programming Verbal Learning Sequences", Teaching Machines and Programmed Learning, pp.486-96, Dept. of Audio-Visual Instr., National Education Asscn. of U.S.A., (1960), pp. 724 + xii.

KLAUS, D. J. "The Art of Auto-Instructional Programming", AV Communication Review, 9, (1961), pp.130-42.

KLAUS, DAVID J. "Programming Techniques", Glaser, Robert (ed.), Teaching Machines and Programmed Learning 2, Data and Directions, NEA DAVI NY, (1965).

KREIDLER, CHARLES W., "The Alternative Question as a Teaching Device", Language Learning, 13, (1963), pp.65-75.

LEITH, G. O. M. "A Handbook of Programmed Learning", Educational Review, Occasional Publicats No. 1, (1964).

LORGE, IRVING, "Predicting Readability", Teachers College Record, 45, (1944), pp.404-419.

LUMSDAINE, A. A. "The Development of Teaching Machines and Programmed Self-Instruction", New Teaching Aids for the American Classroom, (1960).

LUMSDAINE, "Investigation to Determine Optimal Learning Units and Optimal Presentations for Use with Automated Teaching", Third Status Report, Air Force Office of Scientific Research, Pittsburgh, (1960).

LUMSDAINE, A. A. "Some Differences in Approach to the Programming of Instruction", Programmed Learning., ed. J.P. Lysaught, (1961).

MARKLE, SUSAN MEYER, Good Frames and Bad: A Grammar of frame writing, Wiley, NY, (1964), pp. xiv + 278.

MARKLE, SUSAN MEYER; EIGEN LEWIS D., and KOMOSKI P. KENNETH, A Programmed Primer on Programming, Centre for Programmed Instruction NY, (1960).

MARTY, FERNAND Programming a Basic Foreign Language Course, Vermont, Hollins College, 1962

MEECHAM, J. D. Programmed Instruction: The Process, (Graficroll Systems Inc.) (1963).

MILTON, O. Programmed Instruction: What it is and how it works, Harcourt Brace, (1963).

MORTON F. RAND, Programming of audio-lingual language skills for self-instructional presentation, Presented at first Conference of Language Programmers, (1961), O'DONNELL, F. J. "Writing programmed materials for use in teaching machines; Classroom Teacher", *Chicago Sch. J.*, 44, (1963), pp.353-8.

PENNINGTON, D. F. and SLACK C. W., "The Material design of effective lessons", *API*, (1962), pp.298-310.

PENNINGTON, D. F. Jr. *Mathetical Lesson Preparation*, (Technical Report 50), NY, TOR Education Inc. (1961).

PIPE, PETER, *Practical Programming*, Holt, Rinehart & Winston (1966).

POPP M. and D. PORTER, "Programming Verbal Skills for Primary Grades", *Audio-visual Communication Review* (1960).

PRESSEY, SIDNEY, L. "Further attempts to develop a Mechanical Teacher", *American Psychologist*, (1946), TMPL. 676.

PRESSEY, S. L. "Basic unresolved teaching-machine problems", *Theory into Practice*, 1, (1962), pp.30-37.

PRESSEY, SIDNEY L. "A Machine for Automatic Teaching of Drill Material", *School and Society*, 25, (1927), pp.549-552.

PRESSEY, S. L. "A Simple apparatus which gives tests and scores - and teaches", *School and Society*, 23, (1926), pp.373-376.

PRESSEY, SIDNEY, L. *Some History regarding self-instructional devices*, Read at Symposium on automation of teaching,American Psychological Asscn. Convention, (1958), pp.674-675.

PRESSEY, SIDNEY, L. "Some perspectives and major problems regarding teaching machines", Lumsdaine Arthur and Glaser Robert (eds.), *Teaching Machines and Programmed Learning*, (1960), pp.497-505.

PRESSEY, SIDNEY L. "Teaching Machine (& learning theory) crises", *Journal Applied Psychology*, 47, (1963), pp.1-6.

PRESSEY, SIDNEY L. "A Third and Fourth Contribution: Toward the coming Industrial Revolution in Education", *School and Society*, 36, (1932), pp.668-672.

PRESSEY, SIDNEY, L. "Development and Appraisal of Devices providing immediate Automatic sorting of Objective tests and concomitant self-instruction", *Journal of Psychology*, 29, (1950), pp.417-447.

PRESSEY, SIDNEY L. "Certain major psycho-educational issues appearing in the conference on teaching machines", Eugene Galanter (ed.), *Automatic Teaching, The State of the Art*, (1959), pp.187-198.

REIBEL, DAVID A. "The Contextually-Patterned Use of English: An Experiment in dialogue-writing", *English Language Teaching*, 19, (1965), pp.64-71.

RIGNEY, J. W. and FRY E. BRYAN, "Current Teaching-Machine Programs and Programming Techniques", *Audio-visual Communications review*, 9, (1961), pp.120 pages.

RIGNEY, and FRY, BRYAN, "Current Teaching-Machine Programs and Programming Techniques", *AV Communication Review*, 9, (1961), pages 120.

RIGNEY, JOSEPH W. and FRY E. B. *A Survey and analysis of current teaching machine programs and programming*, Technical Report 31, Electronics Personnel Research Group, Uni. of S.California.

RONDEAU, GUY, Programmation et enseignement de l'orthographie, Expose presente au XXXe congres de l'ACFAS, (1962).

RONDEAU, GUY, "Programmation et enseignement de l'orthographe", *International A-V Technical Centre*, Col 63/WD 6/5, 7 pages.

ROTHKOPF, ERNEST Z., "A do-it-yourself kit for programmed instruction", *Teachers' College Record*, 62, (1960), pp.195-201.

SCHAEFER, HALMUTH, *A Vocabulary Program Using 'Language Redundancy'* , Report for U.S. Office of Education, Dept. of Psychology, Univ. of Pittsburgh (1961), pp.20.

SHETTEL, H. H.; CLAPP, D. J.; NORTHRUP J. L. and DELATTE A. P., *Development of a programmed training Course in Cobol*, American Inst. for Research, Pittsburgh, (1963).

SKINNER, B. "Why we need teaching machines", *Harvard Educational Review*, 31, (1961), pp.388.

SKINNER, BURRHUS, F. "Are theories of learning necessary?", *Psychological Review*, 57, (1950), pp.193-216.

SKINNER, BURRHUS, F. *The behavior of organisms,* An Experimental Analysis, Appleton-century-Crofts, (1938).

SKINNER, B. F. and HOLLAND J. G. "The Use of Teaching Machines in College Instruction - Part 2", *Teaching Machines and Programmed Learning*, eds. A.A. Lumsdaine and R. Glaser, (1960),pp.159-72.

SKINNER, B. F. "Comments on'The Impact of Advancing technology on methods in Education' by Dr. Simon Ramo", *American Psychologist*, 14, (1959), p.685.

SKINNER, BURRHUS FREDERICK, "The Control of Human Behavior", *Transactions of the NY Academy Sciences*, 17, (1955), pp.547-551.

SKINNER, BURRHUS F. The Experimental Analysis of Behavior", *American Scientist*, 45, (1957), pp.343-371.

SKINNER, BURRHUS FREDERICK, *Final Report to Human Resources*, Research Office (1957), pp.683-4.

SKINNER, BURRHUS, F. "Freedom and the control of men", *The American Scholar*, (1955-1956), pp.3-18.

SKINNER, BURRHUS F. "The generic nature of the concepts of stimulus and response", *Journal of General Psychology*, 12, (1935), pp.40-65.

SKINNER, BURRHUS F. *Programming verbal knowledge for automated instruction in Schools and Colleges*, Read at Symposium on Automation of Teaching American Psychological Assn. Convention (1958), p.684.

SKINNER, BURRHUS FREDERICK "The Programming of Verbal Knowledge", Galanter Eugene, Automatic Teaching, the State of the Art, (1959), pp.63-68.

SKINNER, B. F. "Reflections on a decade of teaching Machines", Teachers College Record, 65, (1963), pp.168-177.

SKINNER, BURRHUS, F. "Reinforcement today", American Psychologist, 13, (1958), pp.94-99.

SKINNER, BURRHUS F. "Reply to question in inside opinion", Programmed Instruction, 1, (1961).

SKINNER, B. F. Report on the Development of Methods of Preparing Materials for Teaching Machines, Report to Humrro (1975), pp.681-2.

SKINNER, BURRHUS F. Science and Human Behavior, Macmillan, NY, (1953).

SKINNER, BURRHUS F. "The Science of Learning and the Art of Teaching", Harvard Educational Review, 24, (1954), pp.86-97.

SKINNER, BURRHUS FRED. and MORSE, W. H. "A Second type of 'Superstition' in the Pigeon", The American Journal of Psychology, 70, (1957), pp.308-311.

SKINNER, BURRHUS F., "Some contributions of an experimental analysis of behavior to psychology as a whole", American Psychologist, 8, (1953),

SKINNER, BURRHUS F., "Something good happens to a child", Phi Delta Kappan, 42, )1960), pp.27.

SKINNER, BURRHUS F., "Special problems in programming language instruction for teaching machines", Oinas F.J. (ed.), Language Teaching Today, International Journal of American Linguistics, 26, (1960), pp.167-174.

SKINNER, B. F. "Superstition in the pigeon", J. Exp. Psychol. 38, (1948), pp.168-172.

SKINNER, B. F. "Teaching Machines", Science, 128, (1958), pp.969-977.

SKINNER, B. F. "Teaching Machines", Scientific American, 205, (1961), pp.90-102.

SKINNER B. F. "The theory behind teaching machines", Journal of the American Society of Training Directors, (1961).

SKINNER, BURRHUS, F. Verbal Behavior, Appleton-Century-Crofts, NY, (1957), pp.478.

SMITH, D. E. P. "Speculations: Characteristics of Successful Programs and Programmers", Automatic Teaching: The State of the Art, ed. E. Galanter, (1959), pp.91-102.

SPACHE, GEORGE, "A New Readability Formula for Primary Materials", in C.W. Hunnicutt and W.I. Iverson (eds.), Research in the Three R's, (1958).

THOMAS C. A.; DAVIES, I. K.; OPENSHAW D. and BIRD J. B. "Programmed Learning in Perspective, A Guide to Programme Writing", Lamson Technical Products, Barking, (1963), pp.182, Bibliog.

TRITTIPOE W. J.; TRITTIPOE T. G. and HAHN, C., "The effectiveness of Three Programmed-Learning Frame Styles", Journal of Programmed Instruction, 2, (1963), p.35.

WALTHER, R. E. A Guide to Preparing Intrinsically Programmed Instructional Materials, U.S. Industries, undated.

WEAVER, DAVID O. "Suggested techniques in preparing programmed learning: the elements of 'how to' for linear programming", The Journal of the American Society of Training Directors , ( 1961).

## THEORETICAL STUDIES

AID (Auto-Instruction Devices) monthly, *INRAD* (Institute of International Research and Development), Lubbock, Texas.

AID: AUTO-INSTRUCTIONAL DEVICES FOR EDUCATION AND LEARNING, Institute of International Research and Development, Lubbock, Texas.

*American Psychologist*, 17, (1962), 2.

A.P.L. Newsletter, (Association of Programmed Learning, Great Britain).

*Audiovisual Instruction*, monthly, National Education Assoc. Dept. of *Audio-Visual Instruction*, Washington DC.

*Automated Teaching Bulletin*, Rheem Califone Corp., Hollywood, 38, Calif.

*AV Communication Review*, National Education Assoc., Dept. of Audio-*Visual Instruction*, Washington, DC.

*A-V. Communication Review*, 10, (1962), 2.

ASTRA ZENITY CORPORATION , Auto-score, The Corporation, 515 Madison Ave., NY.

CPI NEWSLETTER, Center for Programmed Instruction, 365 West End Av., NY, 24, NY.

C.P.I., "The Use of Programmed Instruction in U.S. Schools;" Report of a survey of the use of PI materials in the Public Schools of the U.S. during the year 1961-2.

"Choosing a program", *Programmed Instruction*, 2, (1961), p.6.

ILLINOIS UNIVERSITY, Comparative studies of principles for programming mathematics in automated instruction, Urbana, Illinois, the University, (1962).

JOINT COMMITTEE REPORT, "Criteria for Assessing Programmed Instructional Materials", *The Journal of Programmed Instruction*, 2, (1963), pp.57-67.

"Evaluation, Criteria for assessing programmed instructional materials. Joint Committee on programmed instruction and teaching machines," *Bibliog, AV. Instr*., 8, (1963), pp.84-9.

[illegible], "Delta college offers self-help program to community adults," *AV. Instr*, 8, (1963), pp.589.

DIRECTORY OF AUTOMATED TEACHING: A LIST OF PERSONS, *AUTOMATED TEACHING BULLETIN*, 1, (1961), pp.28-46.

YALE MOTION PICTURE RESEARCH PROJECT, "Do motivation and participation questions increase learning?", *Educational Screen*, 26, (1947), p256ff

*Educational and Psychological Measurement*, 22, (1962), 3.

*Educational Review*, 13, (1961), 2.

"Encyclopaedia House enriches its pitch", *Business Week*, (1961).

"A Guide to the Use of Programmed Instruction", Catholic School Journal, 62, (1962), pp.44-46.

NEW SOUTH WALES UNIVERSITY: EDUCATIONAL RESEARCH UNIT: Introduction to programmed instruction. Proceedings of a conference held at the Uni, (1963), Kensington, (1964.).

Journal of the American Scoiety of Training Directors, monthly. Montclair Printing Co., Montclair N.J.

Journal of Applied Psychology, 46, (1962), p.365.

Journal of Educational Research, "The Teacher and the Machine," 55, (1962), 9.

Journal of Mathetics, Uni. of Alabama.

Journal of Programmed Instruction, quarterly. Centre for Programmed Instruction, NY, 24, NY.

Journal of Programmed Instruction (U.S.A.), [redacted], 2500, (1965), pp.803-8., 2505, (1963), pp.1143, and 2507 (1963), pp.1263, (Teaching Machines and programmed learning, symposium).

AERO SERVICE LTD., The New Aero-tronic Learning Center now brings programmed instruction to any Classroom, (Aerotronic AT-100), 1048A Rocky Point Rd., Ramsgate, N.S.W.

[redacted],"New Kind of High School for adults", Ill Ed., 51, (1962), pp.108-9.

UNESCO: New Methods and Techniques in Education, Ed. Stud. & Doc., 48.

"New Programs that put the Modern in modern Language Teaching", Encyclopaedia Britannica Bericht.

Phi Delta Kappan, Programmed Instruction number, 44, (1963), 6.

"Programmed Learning. Foundation for Research on Human Behavior", Bibliog, The Foundation, (1961), (Ann Arbor, Mich).

"Programmed Learning", Symposium Bibliog. Clearning House, 38, (1963), pp.136-54.

"Projector Programmer", Davis Scientific Bulletin, (1959), pp.151.

"Programmed Instruction,"Ed. (N.S.W.), 45, (1964), 3.

Programmed Instruction (Center for Programmed Instruction, U.S.A.).

Programmed Instruction (bulletin), Centre for Programmed Instruction, NY, 24, NY.

Programmed Instruction, McGraw Hill Book Co.

"Programmed Learning", Time, 77, (1961), pp.36,38.

Programmed Learning (Great Britain).

"Programmed Learning Materials Report No. 2", Temac, Encyclopaedia Britannica, Wilmette, 3, (1961).

Programming of Audio-lingual language skills for self-instructional presentation, The University of Michigan, 121 pages.

Phi Delta Kappan, "Special issue of Programmed Instruction", 44, (1963), 6.

"A Radical Experiment in Teaching elementary algebra", School Management, 4, (1940), pp. 64, 65, 68, 69.

"A Search for a faster and a better way to learn", Dartmouth Alumni Magazine, (1961).

DAVI, NEA: Selection and use for programmed materials, A Handbook for teachers, Washington (1964).

"Self Instruction", Audio-visual Instruction, 6, (1961), 4.

[redacted]: "Summer offerings in programmed learning", AV. Instr., 8, (1963), pp.107.

"Teaching Machines and Programmed Learning", Symposium Bibliog., il, NEA J., 50, (1961), pp.15-30.

NATIONAL EDUCATION ASSOCIATION: "Technological Development project", Teaching Machines and Programmed Learning, (1962).

"Two Minds on Programming", Times Educational Supplement, 2491, (1963), p.296.

AASA STAFF, "Tools for Teaching", National Education Association Journal, (1959), D.C.P. 51.

TRAINING RESEARCH ABSTRACTS, American Society of Training Directors, 1, (1961), 1.

Tutorage: Newsletter of Automated Teaching.

"University of Kansas Conference on programmed Learning", Kansas Uni. School of Education, Bibliog., Kan.Univ.Kan. Studies Ed., 11, (1961), pp.1-48.

"Using Programs to teach programming skills", Business Automation.

"Wanted: Programmers", Overview, 2, (1962), pp.33-4.

AACTE: Working papers on the National Conference on Teaching Education and New Media, (1961), pp

ADAMS, H. "The Modern Library", The Education of Henry Adams, (1931).

DAMS, H. The Degradation of the Democratic Dogma, Capricorn Books, (1958).

ADAMS, J. J. "Does the Tachistoscope Help?", California Teachers Association Journal", 50, (1954), pp.20.

ADKINS, D. C. "Measurement in Relation to the Educational Process", Educational and Psychological Measurement, 18, (1958), pp.221-40.

ALBRIGHT D., "Approach to programming", Clearing House, (High Schools), 36, (1961), pp.206-8.

ALEXANDER, H.W.; BARLOW, J. A., and GILPIN J. An Experiment on Modes of Presentation of Programmed Learning Materials, (Self-instruction Project), Richmond, Ind. Earlham College (1961).

ALEXANDER, HOWARD and GILPIN JOHN, "A Ready Method for Self-Instruction Program Presentation", Earlham College, Richmond, Indiana.

ALLEN, W. H. "Readability of Instructional Film Commentary", Journal of Applied Psychology, 36, (1952), pp.164-68.

ALMON, T. F. "A Course in Reading Training", College English, 13, (1951), pp.106-108.

ALTER, MILLICENT, "Technical Report 620917: Retention in Programmed Instruction", Articles on Programmed Instruction, (1962), pp.35.

ALTER, MILLICENT, "Retention in Pl", CPI, (1962).

ALTER, MILLICENT; EIGEN LEWIS D., and KING, SHIRLEY, "The Effectiveness of Confirmation plus trinket reinforcers in young children", Articles on Programmed Instruction, (1962), pp.22.

ALTER, MILLICENT and SILVERMAN ROBERT E., "Response in Programmed Instruction", The Journal of Programmed Instruction, 1, (1962), pp.55-78.

ALVARO, P. "An electronic recording system to overcome Language Barriers", Taalonderwijs (1961), No.2.

AMMONS, R. B. Knowledge of performance, Survey of Literature, some possible applications and suggested experimentation, WADC Technical Report 54-14, (1954.)

AMSEL, A. "Some Comments on the Manipulation of Error Responses and Reinforcement Schedules in Self-Instructional Training Devices", Unpublished Staff Memorandum, Maintenance Lab. AFPTRC, Lowry Air Force Base, Colo, (1957).

AMSEL, ABRAM, "Error responses and reinforcement schedules in self-instructional devices", Lumsdaine & Glaser, (1960), pp.506-516.

AMSEL, A. Some Comments on the Manipulation of errorresponses and reinforcement schedules in self-instructional training devices, Unpublished Staff Memorandum, Maintenance Lab. AFPTRC. Lowry Air Force Base, Colo. (1957).

ANDERSON, K. E. and EDWARDS, A. J. "Educational Process and Programmed Instruction," J. Ed. Res., 55, (1962), pp.537-543.

ANDERSON, S. B. "Analysis of responses in a task drawn from calculus of propositions", NRL Memorandum Report (1956), 608.

ANDREAS, BURTON Research findings related to Automated Teaching, Unpublished Paper presented before Genesee Valley School Study Council, Uni. of Rochester (1960).

ANGELL D., and LUMSDAINE, A. A. Prompted Plus Unprimpted Trials Versus Prompted Trials Alone in Paired-Associate Learning, Pittsburgh: American Institute for Research (1960).

ANGELL, DAVID and LUMSDAINE ARTHUR A. "The effects of prompting trials and partial-correction procedures on learning by anticipation", San Mateo, Calif., Amer. Inst. for Research, (1961), pp.47.

ANGELL, DAVID and LUMSDAINE, ARTHUR A. "Prompted and Unprompted Trials versus Prompted trials only in paired-associate Learning", *SPI*, (1961), pp.389-398.

ANGELL, DAVID and LUMSDAINE ARTHUR A. "Prompted plus unprompted trials versus prompted trials alone in paired-associate learning", *Research Report AIR-314-60-IR-129*, (1960), pp.19.

ANGELL, DAVID, and LUMSDAINE ARTHUR A. "A Study of subject controlled partial cueing in paired associate learning", *American Institute for Research*, (1961), pp.13.

ANGELL, DAVID and LUMSDAINE, ARTHUR A. "Retention of material presented by auto instructional programs which vanish and which do not vanish verbal cues", *American Institute for Research*, (1962), pp.13.

ANGELL, GEORGE, "The effect of immediate knowledge of Quiz results on final examination scores in Freshman chemistry", *Journal of Educational Research*, 42, (1949), pp.391-94.

ANGELL, GEORGE W. and TROYER MAURICE E. "A New self-scoring test device for improving instruction", *School & Society*, 67, (1948), p.84.

ARNOULT M. D. *A Comparison of training methods in the recognition of spatial patterns*, Lackland Air Force Base, AF Personnel and Training Research Centre (1956).

ARNSTINE, G. "Languages and Values of Programmed Instruction", Theories and Principles, Bibliog. *Ed. Forum*, (1964).

ASH P. and JASPEN N. *The Effects and Interaction of Rate of Development, Repetition, Participation and Room Illumination on Learning from a Rear-Projected Film*, Special Devices Centre, Office of Naval Research, (1953). Technical Report SDC 269-7-39.

ASHBY, W. R. *Introduction to cybernetics*, Chapman & Hall, (1956).

ASHER, JAMES J. Sensory interrelationships in the automated teaching of FLs, Psych. Dept. San Jose State College, Calif., (1962), pp.99.

ATKINSON, S. B. *Radio in Secondary Education*. Master's Thesis, Cambridge;Harvard Uni. (1927).

AUBLE, D. and MECH. E. V. "Partial Verbal Reinforcement Related to Distributed Practice in a Classroom Situation", *Journal of Psychology*, 36, (1953), pp.165-86.

AUBLE, D. and MECH, E. V. "Quantitative Studies of Verbal Reinforcement in Classroom Situations 1: Differential reinforcement related to the frequency of error and correct responses", *Journal of Psychology*, 35, (1953), pp.307-312.

AUSTWICK KENNETH, "Automated Teaching in the UK", Goldsmith M., Mechnisation in the Classroom, L. Souvenir Press, (1963), pp.133-145.

AUSTWICK, KENNETH "Principles and problems of programming", *Visual Education*, (1963), pp.2-7.

AUSTWICK, KENNETH, "Teaching Machines and Programmed Learning. An Interim Assessment", Forum, 6, (1964), pp.48-51.

AUSUBEL, D. P. and FITZGERALD D. "Organizer, General Background, and ante-cedent Learning variables in sequential verbal learning", AV Communication Review, 53, (1962), pp.243.

AZRIN, N. H. "Some effects of two intermittent schedules of Immediate and non-Immediate Punishment", Journal of Psychology, 42, (1956), pp.3-21.

BAKER, JAMES D. "Programmed Instruction as a Methological Tool in Psychological Research", The Journal of Programmed Instruction, 2, (1963), pp.19-24.

BAKER, K. E. WYLIE, R. C. and GAGNE, R. B. "Transfer of Training to a Motor skill as a function of variation in rate of response", Journal of Experimental Psychology, (1950), pp.721-732.

BALL, J. "Training programers and writing programs", Ed., 83, (1963), pp.400-5.

BAISON, MAURICE, "A Critical view of the Application of Learning", Theory to Programmed Instruction.

BAISON, MAURICE, "A Critical view of the application of learning theory to programmed instruction", The Australian Journal of Education, 9, (1965), pp.215-224.

BANGHART, F. W. "Experimental Study of programmed versus traditional elementary school mathematics", Arith. Teach., 10, (1963), pp.199-204.

BAMFORD, H. E. Jr. The Use of Training Aids in Conceptual Training, American Inst. of Research (1955).

BANTA, T. J. "Attitudes toward a programmed text: The analysis of behavior compared with A textbook of psychology", Rating, Bibliog. Av. Comm. R., 11, (1963), pp.227-40.

BARBE, W. B. "The Effectiveness of Work in Remedial Reading at the College Level," Journal of Educational Psychology, 43, (1952),pp.229-37.

BARBOUR, HUGH, "Programmed Learning in Religion", Programs, Teachers and Machines, (1964), pp.261-270.

BARCUS, DELBERT; HAYMAN JOHN L. .Jr. and JOHNSON, JAMES T., "Programming Instruction in Elementary Spanish", Phi Delta Kappan, 44, (1963), pp.269-272.

BARLOW, JOHN A. Programmed Instruction in Perspective: Yesterday, Today and Tomorrow", Filep, (1963), pp.3-15.

BARLOW, JOHN A. "PI in perspective: Yesterday, today and tomorrow", PIP, (1963).

BARLOW, JOHN A. "A Review of Automated teaching: The State of the Art", (ed. E.H. Galanter,), *Harvard Educational Review* (1960).

BARRY, R. F. and SMITH P. E. "An Experiment in Ninth-Grade Reading Improvement", *Journal of Educational Psychology*, 45 (1954), pp.407-14.

BARSON, J. "Selection and use of programmed instruction report of a national conference", *Av. Instr*., 8, (1963), pp.610-[illegible].

BAUER, ERIC W. "Auto-instruction, programmed learning and individual differences", *International A-V Technical Centre*, Col 63/WD 5/9, 2 page outline.

BEANE, DONALD G. *A Comparison of linear and branching techniques of PI in plane geometry*, Uni. of Illinois, Urbana (1962).

BECK, JACOB, and SHAW W. A. "Learning and Teaching: An Analysis and characterisation", *Memorandum EP-9*, Uni. of Penn, (1960).

BENNETT, G. K. *Development of a Morse Code Actuated Printer*, Applied Psychology Journal OSRD (1945), OSRD Report 6233.

BERG, I. A. "The Use of Human Subjects in Psychological Research", American Psychologist, 9, (1954), pp.108-11.

BERGER, E. J. "Devices for a Mathematics Laboratory", *Mathematics Teacher*, 43, (1950), pp.287-90.

BERGER, E. J. "A Mechanical Device for Drawing the Sine Curve", *Mathematics Teacher*, 46, (1953), pp.210-13.

BIJOU, S. W. "A Systematic Approach to an Experimental Analysis of Young Children", *Child Development*, 26, (1955), pp.161-68.

BIJOU, S. W. "Methodology for an Experimental Analysis of Child Behavior", *Psychological Reports* 3, (1957), pp.243-50.

BIJOU, S. W. "A Child Study Laboratory on Wheels", *Child Development*, 29, (1958), pp.425-27.

BIJOU, S. W. "Operant or Instrumental Studies with Children Using Baseline Measures" Paper read at Annual Convention of the American Psychological Asscn., (1958).

BILSKY, M. *Implication of Programmed English Teaching for Mentally Retarded Children*, Unpublished Thesis presented at Allerton Park Conference on Automation in Special Education (1960).

BIRCH, JACK W. and STUCKLESS E. ROSS "The Development and evaluation of PI in Language for children with auditory disorders," *Uni. of Pittsburgh* (1962).

BLACKMAN, L. S. and HOLDEN E. A. "Support vs non-support in an autoinstructional word program for educable retardates", Bibliog. *Am. J. Men. Deficiency*, 67, (1963), pp.592-600.

BLOOM B. S. and KRATHWOHL D. R. *Taxonomy of Educational Objectives*, Longmans, Green & Co. (1956).

BLYTH, JOHN W. "Behaviorism is not enough", *The American Behavioral Scientist*, 6, (1962), 3.

BOEHM, GEORGE A. "Can People be taught like pigeons?", Fortune, (1960).

BORTOLAZZO, J. L. An Evaluation of Instructional Film Usage in U.S. Navy Training Activities in World War 2, Doctor's Thesis, Cambridge: Harvard University (1949).

BOUTHWELL, W. D. "What's happening in education?", Nat. Parent Teach. 54, (1960), pp.11-12.

BOWERS, N. D. "Psychological forces influencing curriculum decisions: Automated Instruction and Teaching Machines, R. Ed. Res., 33, (1963), pp.271-272.

BRAINE, MARTIN D. S. On Learning the grammatical order of words in sentences of artificial and natural languages, Read at American Psychological Asscn. Meeting (1961).

BRANDWEIN, P. F. The Gifted Student as Future Scientist, Harcourt, Brace & Co. (1955).

BRIGGS, L. J. "Intensive Classes for Superior Students", Journal of Educational Psychology, 38, (1947), pp.207-15.

BRIGGS, LESLIE J. Applied Research Problems, Paper read at Symposium on Automated Teaching, Western Psychological Asscn. Convention San Diego, (1959).

BRIGGS, LESLIE J. Design of Maintenance Training Equipment for Fighter Interceptor, fire Control Systems, Tech. Memorandum, Maintenance Lab. AFPTRC, Lowry Air Force Base (1957).

BRIGGS, LESLIE, "The Development and Appraisal of Special Procedures for superior students and an analysis of the Effects of 'knowledge of results'", Ohio State Uni. Abstracts of Doctoral Dissertations, 58, (1949), 41-9.

BRIGGS, LESLIE J. "Instructional aids", J.Higher Ed., 33, (1963), pp.335-6, 452-4, 34, pp 168-70.

BRIGGS, LESLIE J. Problems in simulation and programming in the design of complex-skill trainers , Paper at Symposium on Research Issues in the Study of Human Learning raised by developments in automated Teaching Methods, American Psychological Asscn. Convention (1959).

BRIGGS, F. A. "End of teaching's status quo?", Programmed Teaching, il. Tex. Outl., 47, (1963), pp.24-6.

BRIGGS LESLIE J. "Instructional Aids (cont.)", Programmed Teaching, J.Higher Ed., 34, (1963), pp.350-2, 516-17.

BRIGGS, LESLIE J. "Prompting and confirmation conditions for three learning tasks employing the subject matter trainer", SPI, (1961),pp.375-388.

BRIGGS, LESLIE J. "Self-pacing versus automatic pacing in paired associate learning", SPI, (1961), pp.399-410.

BRIGGS, L. J. A Survey of Cueing Methods in Education and in Automated Programs, American Inst. for Research (1960).

BRIGGS, L. J.; PIASHINSKI D., and JONES D. C., "Self pacing versus Automatic Pacing of Practice on the Subject-matter Trainer", unpublished Lab. Note, Lowry Air Force Base, Colo, (1955).

BRINKMANN, ERWIN H. "Educability in Visualization of Objects in Space", Doctoral Thesis, Uni. of Michigan, Ann Arbor, (1963).

BRODERICK, W. F. "New patterns of learning", *Ed. Mag*., 7 arts, various issues.

BROOKS, LLOYD O., "Response latency in programmed learning", PhD Dissertation, Uni. of Houston, (1961).

BROWN, C. G. "Teaching Spelling with a Tachistoscope", *English Journal*, 40, (1951), pp.104-105.

BROWN G. I. and HODGKINSON, H. L. "A Note Concerning 'An Application of Recent Developments in Psychology to the Teaching of German' by C.B. Ferster and S.M. Sapon", *Harvard Educational Review*, 28, (1958), pp.156-57.

BROWN, J. L. "Vocabulary via Tachistoscope", *Educational Screen*, 30, (1951), pp.274,287.

BRYAN, G. L. and RIGNEY, J. W. *An Evaluation of a Method for Shipboard Training in Operations Knowledge*, Tech. Report No. 18, Office of Naval Research, Dept. of Psychology, Uni. of S.California, (1956).

BUCHWALD, A. M. "Extinction After Acquisition Under Different Verbal Reinforcement Combinations", *Journal of Experimental Psychology*, 57, (1959), pp.43-48.

BUGELSKI, B. R. *The Psychology of Learning*", Henry Holt & Co. (1956).

BURNS, JOHN L. *Communications and Education*, Reprint of speech delivered at Meeting of National School Boards Asscn. (1958).

BURTON, BENJAMIN B. and GOLDBECK, ROBERT A. *The Effect Response Characteristics and MC Alternatives on Learning during PI*, American Instit. for Research, (1962), pp.16.

BUSTOZ, J. "Division by zero, impossible!", *Grade Teach*, 80, (1963), pp.62-3+

BUSWELL, G. T. *Remedial Reading at the College and Adult Levels: An Experimental Study*, Supplementary Educational Monograph No. 50, Uni. of Chicago Press, (1939).

CALIFORNIA STATE DEPT. OF EDUCATION, *Educational Programs for Gifted Pupils*, Sacramento: The Dept. (1960).

CALVIN A. "Programmed learning and school design", *Am. Sch. & Univ*., 34, (1962), pp. E7-E8.

CAMPBELL, V. N. "Bypassing as a way of adapting self-instruction programs to individual differences", *Bibliog. J. Ed. Psychol*., (Research), 54, (1963), pp.337-45.

CARNEY, C. D. "An Experiment in Teaching 'Mechanical Arithmetic' in an Elementary School", *Business Education World*, 32, (1951),pp.128-29.

CARPENTER, C. R. and others, An Investigation of Closed Circuit Television for Teaching Univ. Courses, State College, PA, The University, (1955).

CARR, A. R. "Using a calculator to Develop Basic Understandings and Meanings in Arithmetic", Mathematics Teacher, 43 (1950),pp.195-96.

CARR, W. J. "Bibliography on Teaching Machines", Unpublished report, Lewisburg, Pa., Buckness Uni. (1958).

CARR, W. J. Self-Instructional Devices: A Review of Current Concepts, Wright-Patterson Air Force Base, Ohio, Aero-Space Medical Lab., Wright Air Development Centre, (1959), WADC Technical Report 59-503.

CARR, W. J. "A Functional analysis of self-instructional devices", Lumsdaine & Glaser, (1960), pp.540-562, (Originally entitled: Self-Instructional Devices: A Review of Current Concepts).

CARR, W. J. "A Review of the Literature on Certain Aspects of Automated Instruction", Report, (1959), to Dr. J. Charles Jones, Bucknell Uni. rp. Lumsdaine & Glaser, WADC Technical Report 59-503 (1959), Air Research, Smith & Moore (1962), pp.57-80.

CARMIR, F. L. "Human teacher is still best", Calif. Teach. Assn. J., 56, (1960), pp.41-4.

CARROLL, J. B. and SAPON, S. M. "Cross Validation of Foreign Language Aptitude Tests with a Second Air Force Trial Course Sample", Report No. 2. The Harvard Language Aptitude Project (1955).

CARROLL, J. B.; SAPON, S. M. and RICHARDS S. E. "Construction and Validation of a Test Battery for Predicting Success in Spoken Foreign Language Courses", Report No. 1. The Harvard Language Aptitude Project (1954).

CARROLL, JOHN BISSELL "A Primer of Programmed Instruction in FL Teaching", International Review of Applied Linguistics in Lang. Teaching, 1, (1963), pp.115-141.

CARTER, H. L. "A Combined Oral Reading and Psychogalvanic Response Technique for Investigating Certain Reading Abilities of College Students", Journal of Applied Psychology, 34, (1950), pp.267-69.

CARTIER, FRANCIS A. "After the programming fad fades - then what?", Visual Education, (1964), pp.2-5.

CASON, E. B. Mechanical Methods for Increasing the Speed of Reading, Teachers College Contributions to Education No. 878., Columbia Uni. (1943).

CHAPMAN, R. L. and KENNEDY, J. L. "The Background and Implications of the Systems Research Lab. Studies", Symposium on Air Force Human Engineering, Personnel and Training Research, (1956).

CHAPMAN, ROBERT L. Design Challenges in employing programmed learning, Los Angeles, Thompson-Ramo-Wooldridge, (1961).

CHAVEZ, SIMON, "Why not rig your classroom quiz?", *Audio-Visual Instruction*, 6, (1961), 139

CHING, DORIS, "Evaluation of a program for the improvement of English language ability and reading achievement in Hawaiian bilingual children", Unpublished doctoral dissertation, Harvard Univ. (1960).

CLARK, J. F. "Programmed learning my first six months", *Bibliog, Math Teach.*, 55, (1962), pp.579-81.

COHEN, DAVID, "PI and teaching machines", *Australian Journal of Education*, 8, (1964), pp.7-17.

COHEN, IRA S., "Programmed Learning and the Socratic Dialogue", *American Psychologist*, 17, (1962), pp.772-775.

COLEMAN, WILLIAM A. "Instant learning", *The American Weekly.*, (1960), pp.10-11.

CONIGLIO, M. B. "Teacher turns programmer", *Tex. Outl.*, 47, (1963). pp.26-7.

CONNOR, DAVID V.(ed)."Introduction to programmed instruction", Conf. held at Uni. N.S.W., (1963), Ed. Res. Unit, Kensington pp.121.

COOK, DESMOND L. "Programmed Instruction and AV Personnel in the Future", bibliog, *AV Communication Review*, 10, (1962), pp.238-249.

COOK, DONALD A. "On vanishing stimuli in instructional material", *Automated Teaching Bulletin*, 1, (1960), pp.32., also *Journal of the Experimental Analysis of Behavior*, 3, (1960), pp.600-1.

COOK, DONALD A. "Programmed learning: A Revolution in instruction", *Graduate Faculties Newsletter*, (1960).

COOK, DONALD A. "Studying the Performance of a program", *The American Behavioral Scientist*, 6, (1962), 3,

COOK, DONALD A., and MECHNER FRANCIS, "Fundamentals pf PI", *API*, (1962), pp.2-14.

COOK, FRED S., "Some advantages and limitations of self-instructional devices", *Balance Sheet*, 42, (1960), pp.154-156.

COOK, J. O. "Processes Underlying the Learning of a Single Paired-Associate Item", Unpublished Staff Memorandum, Maintenance Lab. AFPTRC, Chanute Air Force Base Field Extension (1956).

COOK, JOHN OLIVER, "From Audience participation to paired-associate learning", *SPI*, (1961), pp.351-366.

COOK, JOHN OLIVER, "Response analysis in paired associate learning experiments", *SPI*, (1961), pp.367-376.

COOK, JOHN OLIVER, "Research in AV Communication", Ball J. and Byrnes F. C. (eds.), Research, Principles and practices in Visual Communication, East Lansing, Michigan, National Project in Agricultural communications, Michigan State Uni, (1960), pp.91-106.

COOK, J. O. "Supplementary Report: Processes Underlying Learning a Single Paired-associate item", Journal of Experimental Psychology, 56, (1958), pp.455.

COOK, JOHN OLIVER and KENDLER TRACY S. "A Theoretical model to explain some paired-associate learning data", (Finch, G. and Cameron F), Symposium on Air Force Human Engineering, National Academy of Sciences, Washington, National Research Council publication 455, (1956), pp.90-98.

COOK, JOHN OLIVER and SPITZER M. E. "Supplementary report: The Effects of between term delay and overt practice of the response term upon paired-associate learning", Unpublished Paper (1959).

COOK, J. O. and SPITZER, M. E. "Supplementary Report: Prompting versus confirmation in paired-associate learning', Journal of Experimental Psychology, 59, (1960), pp.275-276.

COOK, T. W. "Factors in massed and distributed practice", Journal of Experimental Psychology, 34, (1944), pp.325-334.

CORNELL, F. G.; DAMRIN D. E.; SAUPE J. L. and CROWDER N. A. Proficiency of Q-24 Radar Mechanics: 3, The Tab Test - A Group Test of Troubleshooting Proficiency, Lackland Air Force Base, Tex., Air Force Personnel andTraining Research Centre, (1954), Research Bulletin AFPTRC-TR-54-52.

COULSON, JOHN E., "Automated Instruction: Theory and design", Presented at Society of Motion Picture and TV Engineers Meeting Hollywood (1960).

COULSON JOHN E., "Combining educational techniques for specific studen and tasks: A concern for research", PIP, (1963).

COULSON JOHN E. "Programming for individual Difference", Paper Read at Symposium on automated teaching Western Psychological Assen. Convention San Diego, (1959).

COULSON J. E. "Programmed instruction: A Perspective", Bibliog, J. Teach. Ed., 14, (1963), pp.372-8.

COULSON JOHN E. (ed.), "Programmed Learning and Computer-based instruction", Wiley, NY, (1962), pp. xv + 291.

COULSON, JOHN E., and SILBERMAN HARRY F., "Automated Teaching and Individual Difference", AV Communication Review, 9, (1961), pp.5-15.

COULSON, JOHN E.; BUSHNELL DON D. and COGSWELL, JOHN E., "Computer-based instructional systems", API, (1962), pp.106-119.

COULSON, JOHN E. and others, "Effects of branching in a Computer Controlled Autoinstructional Device", Journal of Applied Psychology., 46, (1962), pp.389.

COULSON J. E. and SILBERMAN H. F. "Effects of Three Variables ina Teaching Machine", Journal of Educational Psychology, 51, (1960), p.135.

COULSON, JOHN E. and SILBERMAN HARRY F., "Results of an initial experiment in automated teaching", Journal of Educational Psychology, 51, (1960), pp.135-43.

COUNTS, G. S. *Education and American Civilization*, New York: Teachers College, Columbia Uni. (1952).

CRAM, DAVID D. "Explaining Teaching Machines and Programming", Fearon Publishers, 828 Valencia St., San Francisco (1961).

CREEGAN, R. F. "Automated education must it be dogmatic?", *Sch. & Soc.*, 90, (1962), pp.258.

CRESSWELL, S. W. "Chess: A Study of the relationship between intelligence and performance in a programmed learning task", *Educational Review*, 16, (1964), pp.137-144.

CRONBACH, L. J. *Educational Psychology*, New York: Harcourt, Brace & Co. (1954).

CRONBACH, LEE J. "What research says about Programmed Instruction", *National Education Assen. J.*, 51, (1962), pp.45-7.

CORRIGAN, R. E. "Solution to some pressing problems in education", *Calif. Teach. Assn.*, 56, (1960), pp.11-12.

CROSS, K. P. and GAIER, E. L. "Technique in Problem-solving as a Predictor of Educational Achievement", *Journal of Educational Psychology*, 46, (1955), pp.194-206.

CROWDER, N. A. A. Part-Task Trainer for *Troubleshooting*, Lackland Air Force Base Tex., Air Force Personnel Training and Research Centre, (1957), Development Report AFPTRC-TN-57-71.

CROWDER, N. A. *An Automatic Tutoring Book on Number Systems*, Vol. 1, Timonium Md., Hoover Electronics Co. (1958).

CROWDER, NORMAN A. "Automatic Tutoring by Intrinsic Programming", *Teaching Machines and Programmed Learning,* (eds.), A.A. Lumsdaine and R. Glaser, (1960), pp.286-98.

CROWDER, NORMAN A. "The Auto-tutor concept", Presented before San Francisco State Coll, Inst., Training by Automation in Industry (1960).

CROWDER, NORMAN A. "The Concept of Automatic Tutoring", Staff Memorandum, Armament Systems Personnel Research Lab. AFPTRC, Lowry Air Force Base, Colorado, (1955).

CROWDER, NORMAN A. "Intrinsic Programming", Presented at Allerton Park Conference on automation in special ed. (1960).

CROWDER, NORMAN A. "Intrinsic Programming: Facts, fallacies and future", *PIP*, (1963), pp.84-115.

CROWDER, NORMAN A. "Intrinsically programmed materials for teaching complex skills and concepts", Read at Symposium on Automation of Teaching, American Psychological Assen., Convention, Washington (1958).

CROWDER N. A. "Intrinsically programmed teaching devices", Invitational Conferences on Testing Problems. Proceedings (1959), pp.40-52.

CROWDER N. A. "On the differences between linear and intrinsic programming", *Phi Delta Kappan*, (1963), pp.250-4.

CROWDER, NORMAN A. "A Part-task trainer for troubleshooting" Lackland Air Force Base, Texas, Air Force PTRC-TN-57-71 (1957).

CROWDER, NORMAN A. "Self-instructional materials for GETS trainer experimental manual", Maintenance Lab. AFPTRC, Lowry Air Force Base, Colorado, (1956).

CROWDER, NORMAN A. "Simple ways to use the student response for program control", *API*, (1962), pp.120-128.

CUMMINGS, ALLANA, and GOLDSTEIN LEO S. "Technical Report 620919: The effect of overt and covert respondings on two kinds of learning tasks", *Articles on Programmed Instruction*, (1962), 18 + x pages.

CURR, W. "Significance and implications of programmed learning", *Ed. Res.*, 5, (1963), pp.179-182.

CURTIS, F. D. and WOODS G. G. "A Study of the Relative Teaching Values of Four Common Practices in Correcting Examination Papers", *School Review*, 37, (1929), pp.615-23.

DALE, EDGAR, "Audio-visual Methods in teaching", Holt, NY, (1959).

DALE, EDGAR, "Facts in a Frame", Audio-visual Education, Govt. of India, (1959).

DALE, EDGAR and JEANNE CHALL, "A Formula for Predicting Readability", *Educational Research Bulletin*, 27, (1948), pp.37-54.

DALE, EDGAR, "Self-instruction through programmed materials", *The Newsletter*, 26, (1961), pp.1-4.

DALLENBACH, K. M. "The effect of practice upon visual apprehension in school children", *Journal of Educational Psychology*, 5, (1914), pp.321-344, 369-404.

DALLENBACH, K. M. "The Effect of Practice upon Visual Apprehension in the Feeble-minded", *Journal of Educational Psychology*, 10, (1919), pp.61-62.

DARBY, C. L. *An Annotated Bibliography on the Automation of Instruction*, Research Memorandum, U.S. Army Air Defense Human Research Unit, Fort Bliss, Tex., (1959).

DAVID, E. E. Jr. "Voice-actuated machines: Problems & Possibilities", *Bell Laboratories Record*, 35, (1957), pp.281-286.

DAVIDSON, A. O. *Deterrents to Film Use in Schools*, Doctor's thesis, Cambridge, Harvard Univ. (1952).

DAY, E. M. "Implications for the teaching of business by programmed learning", *Am. Bsns. Ed.*, 18, (1962), pp.221-3+.

DAY, J. H. "Intrinsic Programs", *J. Chem. Ed.*, 40, (1963),pp.14-16.

DEARBORN, W. F. and ANDERSON, I. H. "A New Method for Teaching Phasing and for Increasing the Size of Reading Fixations", *Psychological Record*, 1, (1937), pp.459-75.

DEARBORN, W. F.; ANDERSON I. H. and BREWSTER, J. R. "Controlled Reading by Means of a Motion Picture Technique", Psychological Record, 2, (1938), pp.219-27.

DEESE, J. The Psychology of Learning, New York: McGraw Hill Book Co., (1952).

DELLA-PIANA, GABRIEL, "Experimental evaluation of programmed learning", Bibliog. J. Ed. Res., 55, (1962), pp.495-501.

DE MANDACH, A. B. "Conversational Robotapes", MLJ, 38, (1954), pp.138-41.

DESSART, D. J. "Study in programmed learning", Bibliog., f Sch. Sci. & Math. 62, (1962), pp.513-20.

DETERLINE, WILLIAM A. "Human Systems and PI", The American Behavioral Scientist, 6, (1962), 3.

DETERLINE, WILLIAM A. "An Introduction to Programmed Instruction", Prentice-Hall Inc. Englewood Cliffs NJ, (1962), x + 131 pages).

DETERLINE, WILLIAM A. "Response Mode: Different effect or different purpose", AID, (1961).

DEUTSCH, W. D. "Automated Tutors in Industry", Paper read at Annual Convention of Eastern Psychological Assen., Philadelphia (1961).

DEUTSCH, WILLIAM R. "Pre-organized and self-organized automata", presented at San Francisco State College Inst. Training by Automation in Industry (1960).

DEUTSCH, WILLIAM "Programmed Learning: An Overview of personnel and financial requirements", API, (1962), pp.208-211.

DODSON, W. L. "Mechanical Aids in a Practical Reading Program", Texas Outlook, 23, (1939), pp.13.

DOLMATCH, T. B.; MARTING, E. and FINLEY, R. E. American Management Association, Revolution in training: Programmed Instruction in Industry, (1962).

DOUGLASS, P. "Individualized Education for the Programmed Instruction era", Bibliog. Improving Col. Univ. Teach., 10, (1962), pp.79-86.

EARNEST, E. "Must the TV Technicians Take Over?", AAUP Bulletin, 44, (1958), pp.582-88.

EDLING JACK V. "PI in a 'continuous progress' school", Four Case Studies of PI, pp.65-94.

EDWARDS, A. L. Statistical Analysis for Students in Psychology and Education, New York: Rinehart & Co. (1946).

EDWARDS, A. L. Statistical Methods for the Behavioral Sciences, NY, Rinehart & Co. (1954).

EDWARDS, W. D. "Skinner's Teaching Machines", Unpublished Laboratory Note, Maintenance Lab. AFPTRC, Lowry Air Force Base., Colo, (1956).

EDWARDS, W. D. "The Use of Statistical decision functions in making practical decisions", (Finch G. and Cameron F. (eds)., Symposium on AF Human Engineering, personnel, and training research, National Acad. of Scs., Publication, 455 (1956), pp.115-124.

EIGEN, L. D. "A Comparison of 3 modes of presenting a PI sequence", J. Ed. Res., 55, (1962), pp.456-460.

EIGEN, LEWIS D. "An Empirical Approach to the Determination of Sample Size Used in the Development of a Program", Articles on Programmed Instruction, (1960), pp.8. (Carnegie Grant).

EIGEN, L. D. "High-school student reactions to PI", Phi Delta Kappan, 44, (1963), pp.282-285

EIGEN LEWIS D. "Problems of Research in PI", AV Communication Review, 13, (1965), pp.38-43.

EIGEN, L. D. "Programming poses problems", Phi Delta Kappan, 44, (1963), pp.242ff.

EIGEN, LEWIS D. "Some Problems in Field Testing Programs for Teaching Machines", Journal of Educational Sociology, 34, (1961), pp.372-376.

EIGEN, LEWIS D. "Technology and Educational Practice", Articles on Programmed Instruction, (1961), pp.11.

EIGEN, LEWIS D.; FILEP, ROBERT T.; GOLSTEIN LEO S., and ANGALET, BRUCE W., "A Comparison of three modes of presenting a Programmed Instruction Sequence", Articles on Programmed Instruction, (1962), pp.40.

EIGEN LEWIS D. and KOMOSKI, P. KENNETH, "Automated Teaching Project", Collegiate School NY, Center for Programmed Instruction, (1960).

EIGEN, LEWIS D. and FELDHUSEN JOHN F. "Interrelationships among Attitude, Achievement, Reading, Intelligence and Transfer Variables in PI", Midwestern Psychological Asscn., (1963), rp abridged De Cecco, (1964), pp.376-386.

EIGEN LEWIS D., and MARGULIES STUART S., "Response characteristics as a function of Information Level", The Journal of Programmed Instruction, 2, (1963), pp.45-54.

EIGEN, LEWIS D. and MARGULIES, STUART, "Technical Report 620918: Response characteristics as a function of information level", Articles on Programmed Instruction, (1962), pp.20.

ELLIS, B. E. and GARRUTO J. C. "Is programmed instruction favourable to the development of creative insights?", J. Higher Ed., 33, (1962), pp.222-5.

EMESON, D. L. and WULFF, J. J. "The Relationship Between 'What is Learned' and 'How it's Taught'", Technical Memorandum Maintenance Lab. AFPTRC, Lowry Air Force Base, Colo, (1957).

ENGLISH, H. B. "How Psychology Can Facilitate Military Training - A Concrete Example", Journal of Applied Psychology, 26, (1942),pp.3-7.

ENZMANN, A. M. "Changing our Educational Grip", Teach. Col. J., 34, (1962), pp.21-3.

EPPERSON D. C. and SCHMUCK, R. A. "Experimentalist critique of programmed instruction", Bibliog, F. Ed. Theory, 12, (1962),pp.247-54.

ESTES, W. K. and others, Modern Learning Theory. A Critical Analysis of Five Examples, New York: Appleton-Century-Crofts, (1954).

EURICH, A. C. "Better Instruction with Fewer Teachers", Current Issues in Higher Education, (1956), pp.10-16.

EVANS, J. L. "Conversion to Number Bases Other Than Ten", Unpublished programmed text, Uni. of Pittsburgh, Dept. of Psychology (1958).

EVANS, J. L.; HOMME, L.E.; GLASER R., and STELTER C., Descriptive Statistics: A Programmed Textbook (Vol. 1 of a Program in Statistics), (1960).

EVANS, J.; GLASER, ROBERT and HOMME. L. E., "An Investigation of variation in the properties of verbal learning sequences of the 'teaching machine' type", Paper presented at the Meetings of the Eastern Psychological Assoc., Atlantic City (1959).

EVERETT J. BERNARD , "Programmed learning in Public Schools", Symposium on Tomorrow's Teaching, (1961).

FEHR, J. D. "Programming language for deaf children", Volta R., 64, (1962), pp.14-21.

FELDHUSEN J., "Programming and the talented pupil", PROGRAMS, Auto-Instructional, Bibliog. Clearning House, 38, (1963), pp.151-4.

FELDHUSEN J. F. & A. Birt, "Study of nine methods of presentation of programmed learning material", J. Ed. Res., 55, (1962), pp.461-6.

FELDHUSEN J. F. and others, "Teacher vs programmed learning", il. Wis. J. Ed., 95, (1962), pp.8-10.

FELDMAN, MARGARET E., "Learning by programmed and text format at three levels of difficulty", Journal of Educational Psychology, 56, (1955), pp.133-139.

FERSTER, C. B. and SAPON S. M. "An Application of Recent Developments in Psychology to the Teaching of German", Harvard Educational Review, 28, (1958), pp.58-69.

FERSTER, C. B. and SKINNER B. F. Schedules of Reinforcement, New York: Appleton-Century-Crofts, (1957).

FERSTER, C. B. "The role of review material in continuous programming with teaching machines", Indiana Uni. Medical School, (1960). pp.4.

FILEP R. T. "New Reports of programming", Av. Comm. R., 11, (1963), 223-4.

FILEP, ROBERT THOMAS, "The Potential impact of PI on the curriculum and counseling", PIP (1963).

FILEP, ROBERT THOMAS, Programmed Instruction, Centre for PI Inc., NY., Vol. 1.

FILEP R. T. "Programmed Instruction: A Quiet Life?", Nat. Cath. Ed. Assn.Bul., 60, (1963), pp.317-22.

FILEP. R. T. "Programming: A Three-pronged counseling Tool", Bibliog., Av. Instr., 8, (1963), pp.36-9.

FILEP, ROBERT THOMAS, "Report from the new editor", Av. Comm.R. 11, (1963), pp.145-8.

FILEP, ROBERT THOMAS (ed.), Prospectives in Programming, Momn, NY, (1963), pp. xii + 324.

FINN, JAMES D. "A New Theory for Instructional Technology", AV Communication Review, 8, (1960), pp.84-94.

FINN, JAMES D. "Technological development: Its meaning for Education in the 1970's", PIP, (1963).

FINN, J. D. and RICHARDSON E., "Principal faces the new technology", Nat. El. Prin., 40, (1961), pp.18-22, Same Cond. Ed. Digest, 26, (1961), pp.24-7.

FISHER, R. A. The Design of Experiments, Fourth Edition, London Oliver & Boyd, (1947).

FLYNT, R. C. M. and HOLLIS E. V. "Use of Training Aids by Army and Navy", Higher Education, 2, (1945), pp.1-3.

FONSECA JOHN R., "Will Programmed Learning Destroy Us?", Improving College and University Teaching, 13, (1965), pp.100-107.

FORD FOUNDATION, "Fund for the Advancement of Education", Teaching by Television, NY, The Foundation (1959).

FORD, RENEE G., "Evaluating a Chemistry Program", Articles on Programmed Instruction, (1962), pp.15.

FORSETH, W. J. and CHURCHILL D. W. "Books on programmed learning", Minn, J. Ed., 42, (1962), pp.4.

FOUGASSE, REINHARDT, The Good Tempered Pencil, Reinhardt, (1959).

FREEBURNE, C. M. "The Influcence of Training in Perceptual Span and Perceptual Speed Upon Reading Ability", Journal of Educational Psychology, 40, (1949), pp.321-52.

FREEMAN, F. N. "An Experiment in the Use of Typewriters in the Elementary School", Elementary School Journal, 32, (1932), pp.752-59.

FREEMAN, J. T. "The Effects of Reinforced Practice on Conventional Multiple Choice Tests", Automated Teaching Bulletin, 1, (1959),pp.19-20.

FRENCH, R. S. "Evaluation of a K-System Troubleshooting Trainer", Symposium on Air Force Human Engineering, Personnel and Training Research, 455, (1956), pp.160-65.

FRENCH, R. S. and MARTIN L. B. *A Flight-Line Troubleshooting Trainer for a Complex Electronic System: The 'MAC-2 Trainer'"*, Lackland Air Force Base Tex., (1957), Development Report AFPTRC-TN-57-106.

FROBST, G. E. (ed.), Programmed Learning in the Schools: Tasks for 1962.

FRY, E. B. "Teaching Machines: The Coming Automation", *The Phi Delta Kappan*, 41, (1959), pp.28-31.

FRY, E. B. "A Study of Teaching Machine Response Modes", (1960), pp.469-74.

FRY, EDWARD BRYAN, "A Classification of variables involved in a programmed learning situation", Loyola Uni. Los Angeles, California, (1961).

FRY, EDWARD BRYAN, "A Study of Teaching Machine Response Modes", *Summary Doct. Dissert.*, (1960), pp.469-474.

FRYE, C. H. "Group vs individual pacing in programmed instruction", *Bibliog. Av. Comm. R.*, 11, (1963), pp.124-30.

FUSCO, GENE, C. "Programmed self-instruction: Possibilities and limitations", *High School Journal*, 44, (1960), pp.85-90.

FUSCO, G. C. "Technology in the Classroom: Challenges to the school administrator", Bibliog. *f. Il. Sch. Life*, 42, (1960), pp.18-23

GAGNE, R. M. "The Effect of Sequence of Presentation of Similar Items on the Learning of Paired Associates", *Journal of Experimental Psychology*, 40, (1950), pp.61-73.

GAGNE, R. M. "Training Devices and Simulators: Some Research Issues", *American Psychologist*, 9, (1954), pp.95-107.

GAGNE, R. M. and BOLLES, R. C. "A Review of Factors in Learning Efficiency", *Automatic Teaching: The State of the Art*, Ed. E.H. Galanter), (1959), Chap. 2. p. 13-54.

GAGNE, R. M. and BROWN L. T. "Some factors in the programming of Conceptual Learning", *J. Exp. Psych.* 62, (1961), pp.313-321.

GAGNE, ROBERT M. and DICK, WALTER, "Learning Measures in a Self-Instructional Program in Solving Equations", *Psychological Reports*, 10, (1962), pp.131-146.

GALANTER E., (ed.), "Automatic Teaching", Bibliog, *The State of the Art*, (1959).

GALANTER, EUGENE H. "Chairman's Summary of Conference", Abstracts presented at AF Office of Scientific Research and the Uni. of Pa Conference on the Automatic Teaching of Verbal and Symbolic Skills, (1958). pp.627-8.

GALANTER, EUGENE H. "Common statistics uncommonly taught", *Contemporary Psychology*, 6, (1961), pp.104-106.

GALANTER, EUGENE,ed."The Ideal Teacher", Automatic Teaching: The State of the Art, (1959), pp.1-4. (Wiley, NY).

GALANTER, EUGENE, "Two Models of a Student", Teachers College Record, (1960), pp.187-194.

GALANTER, EUGENE H. "Theory of Programmed Learning and Teaching Machines", Tomorrow's Teaching, (1961).

GALANTER, E. "Two Models of a Student", diags. Teach Co. Rec., 62, (1960), pp.187-94.

GARVER, F. M. and MATTHEWS, R. D. "An Analysis of the Results of Speed Drills with the Metron-o-scope to Increase Reading Rate", Journal of Educational Psychology, 30, (1939),pp.693-98.

GATES, A. I. "Recitation as a Factor in Memorizing", Archives of Psychology, 7, (1917), pp.40.

GATES, A. I. The Improvement of Reading, Third Edition, NY., McMillan Co. (1947),

GAUDIN, L. S. "The Language Laboratory", French Reader, 25, (1952), pp.284-91.

GAVURIN E. I. and DONAHUE, V. M. "Logical Sequence and random sequence", Automated Teaching Bulletin, 1, (1961), pp.3-9.

GEIS, G. L. "Some considerations in the evaluation of Programs", AV Communication Review, 10, (1962), pp.64-69.

GEIS, G. L. and KNAPP S., "A Note on non-functional Branching in a Linear Program", Journal of Programmed Instruction, 2, (1963),p.15.

GENERAL DYNAMICS CORPORATION, Electric Boat Division( Groton Conn.), "The All Electronic Autoscore", Unpublished Memorandum.

GHISELLI, E. E. and BROWN C. W. Personnel and Industrial Psychology, NY, McGraw-Hill Book Co, (1948).

GIBSON, J. J. (ed.), Motion Picture Testing and Research, Army Air Forces Report No. 7, Washington D.C., Government Printing Office (1947).

GIBSON, J. J. and others, "History, Organization, and Research Activities, Psychological Test Film Unit, Army Air Force", Psychological Bulletin, 41, (1944), pp.457-68.

GILBERT, A. C. F. "Effect of Immediacy of Knowledge of Correctness of Response Upon Learning", Journal of Educational Psychology, 47, (1956), pp.415-23.

GLASER, R. "Knowledge of Learning and Methods of Training", Unpublished Paper, Uni. of Pittsburgh, (1958).

GLASER, R. "Comments on the Use of Teaching Machine Techniques in the Language Laboratory", Language Teaching Today, (1960), Publication No.14, (Ed. J. Oinas).

GLASER R. and GLANZER M. "Training and Training Research, Pittsburgh Pa., American Institute for Research (1958).

GLASER, ROBERT, "Christmas, Past, present and future", Contemporary Psychology, 5, (1960), pp.24-28.

GLASER, ROBERT, "PI: A Behavioral View", The American Behavioral Scientist, 6, (1962), 3.

GLASER, ROBERT,ed."Psychology and Instructional Technology", Training Research and Education, (1962), NY, Wiley, (1965).

GLASER, ROBERT, "Research and development issues in PI", PIP, (1963).

GLASER, ROBERT, "The Science of learning and programmed instruction", American Institute for Research, (1961).

GLASER, ROBERT, "Some basic notions in programmed learning", American Institute for Research, Pittsburgh, (1961).

GLASER, ROBERT,; HOMME. L. E. and EVANS J. L., "An evaluation of textbooks in terms of learning principles", Paper read at a Meeting of the American Education Research Assen. Atlantic City, (1959), pp.437-445.

GLASER, R.; HOMME, L. E. and EVANS J. L. "An Evaluation of Textbooks in Terms of Learning Principles", Teaching Machines and Programmed Learning, eds. A.A. Lumsdaine and R. Glaser, (1960),pp.437-45.

GLASER, ROBERT, and SCHAEFER, HALMUTH H., "Programmed Teaching", The Journal of Teacher Education, 12, (1961), pp.107-113.

GLASER, ROBERT and FULLICK, MARGARET, "Programmed Learning and Classroom Instruction", Pennsylvania School Journal, 109, (1961), pp.366-9.

GLASER, ROBERT,; DAMRIN DORA E. and GARDNER, FLOYD M., "The Tab item. A Technique for the measurement of proficiency in diagnostic problem solving tasks", Education and Psychological Measurement, 14, (1954), pp.283-293.

GLOCK, M. D. "The Effect Upon Eye Movements and Reading Rate at the College Level of Three Methods of Training", Journal of Educational Psychology, 40, (1949), pp.93-106.

GOEBEL, LAURENCE G. "A Simple Device for Skinner Disc Programs", Audio-visual Instruction, 6, (1961), pp.133.

GOLDBECK, R. A. 'The Effect of Response Mode and Learning Material Difficulty on Automated Instruction, Technical Report 1, American Inst. for Research, Santa Barbara, (1960).

GOLDBECK R. A. and BRIGGS L. J. An Analysis of Response Mode and Feedback Factors in Automated Instruction, (Tech. Report No. 2), American Inst. for Research, (1960). pp.166-191.

GOLDBECK R. A. and CAMPBELL V. N. "The Effects of Response Mode and Response Difficulty on Programmed Learning", Journal of Educational Psychology, 53, (1962), pp.110-18.

GOLDBECK, R. A.; CAMPBELL V. N. and LLEWELLYN J. E. Further Experimental Evidence on Response Modes in Automated Instruction, (Tech. Report No. 3), American Inst. for Research, (1960).pp.24.

GOLDBERG, IRVING A. "An Introduction to PI", API, (1962),pp.15-21.

GOLDSTEIN, LEO S. "Research in Programmed Instruction: An Overview", Articles on Programmed Instruction, (1963), pp. 7 + v.

GOLDSTONE, R. H. "Experiments with Audio-Visual Aids in Teaching Shakespeare", College English, 13, (1952), pp.319-22.

GOODMAN, RICHARD, "Some available teaching Machines: Their advantages and disadvantages", Visual Education, (1963), pp.2-5.

GOODMAN, RICHARD, "Programmed Learning and Teaching Machines", EUP, (1962), pp.39.

GOROW, FRANK, "I Wrote a Scrambled Book", Audio-visual Instruction, 6, (1961), pp.136-137.

GORDEN, S. N. O'CONNOR, and TIZARD J., "Some Effects of Incentives on the Performance of Imbeciles on a Repetitive Task", American Journal of Mental Deficiency, 60, (1955), pp.371-377.

GOTKIN, L. G. "Problems in evaluating automated instruction", L.M. Stolurow, Teach. Col. Rec., 63, (1961), pp.66-70.

GOTKIN, LASSAR G., "Programmed Instruction in the Schools: Individual Differences, the Teacher and Programming Styles", Articles on Programmed Instruction, (1962), pp.21.

GOTKIN, LASSAR G., "Research at the Centre for PI", Mimeo (1962).

GOTKIN, LASSAR G. and GOLDSTEIN LEO, S. "Programmed Instruction for the younger learner: A Comparison of two presentation modes in two environments", Articles on Programmed Instruction, (1962), pp.17.

GOTKIN, LASSAR G., and GOLDSTEIN LEO S., "PI in the Schools: Innovation and Innovator", M.B. Miles, (ed.), Innovation in Education, (1964), pp.231-248. (Columbia Uni.).

GOTKIN, LASSAR G., and MASSA, NICHOLAS, "Technical Report 630205: Programmed Instruction and the Acdemically Gifted: The Effects of Creativity and Teacher Behavior on Programmed Instruction with Younger Learners", Articles on Programmed Instruction, (1963), 12 pages.

GRABBE, E.; RAMO S. and WOOLDRIDGE, D. E. Handbook of Automation, Computation and Control: Vol. 1. Control Fundamentals, NY, John Wiley & Sons (1958).

GRACE, H. A. "Programming and Readability", Evaluation, Bibliog, Calif. J. Ed. Res., 14, (1963).

GREEN, EDWARD J. "The Learning Process and Programmed Instruction", Holt, NY (1962), rp. (1963), pp.xi + 228.

GREEN, EDWARD J. "Reinforcement theory, PI, and the Human Organism", PIP, (1963).

GREENSPOON J. and FOREMAN S. "Effect of Delay of Knowledge of Results on Learning a Motor Task", *Journal of Experimental Psychology*, 51, (1956), pp.226-28.

GRINGS, W. W.; RIGNEY J. W.; BOND, N. A.; and SUMMERS, S. A. A. *Methodological Study of Electronics Troubleshooting Skill: 1, Rationale for and Description of the Multiple-Alternative Symbolic Troubleshooting Test*, Technical Report prepared for the Personnel and Training Branch, Psychological Sciences Division, Office of Naval Research, Dept. of Psychology, Uni. of S.California, (1953).

GROPPER, GEORGE L. "Programming for Group Instruction", Read at *APA Meeting* (1961).

GUETZKOW, H. KELLY, E. L.; and MC KEACHIE W. J. "An Experimental Comparison of Recitation, Discussion, and Tutorial Methods in College Teaching", *Journal of Educational Psychology*, 45, (1954), pp.193-207.

GUILFORD J. P. *Fundamental Statistics in Psychology and Education*, Third Edition, McGraw-Hill Book Co. (1956).

GUSTAFSON C. B. "A Simple Device for Demonstrating Addition and Subtraction in the Binary Number System", *Mathematics Teacher*, 47, (1954), pp.499-500.

GUTHRIE, E. R. *The Psychology of Learning*, NY, Harper & Bros. (1935).

GUTHRIE E. R. "Conditioning: A Theory of Learning in Terms of Stimulus Response Association", *The Psychology of Learning*, Chap. 1., (1942), pp.17-60.

HANZELI VICTOR E. "Report on the first conference of language programmers", Uni. of Washington, (1961).

HARTLEY, J. "Some guides for evaluating programmes", London, *Association for Programmed Learning* (1963).

HARTMAN, T. F. "Active responding in programmed learning materials", *J.Ap.Psych*, 47, (1963), pp.343-347.

HAYES, ALFRED S.; LANE, HARLAN L.; MUELLER, THEODORE, and SWEET WALDO E., "A New Look at Learning", *Current Issues in Language Teaching*, (1962), pp.18-60.

HEBB, D. O. *The Organization of Behavior*. NY, John Wiley & Sons (1949).

HEDES, J. H. and REVSIN B. "Programmed instruction at the college le........, A Study of several factors influencing learning", Bibliog. *Phi Delta Kappan*, 44, (1963), pp.286-91

HEIMER, R. T. "Some implications of programmed instruction for the teaching of mathematics", *Math. Teach.*, 54, (1961), pp.333-5.

HEISLER F. "Programmed learning can better teacher pupil relationship", *Grade Teach.*, 79, (1962), pp.54.

HENDERSHOT, C. H. "Programmed Learning", A Bibliography of Programs and presentation devices, Michigan, National Society for PI, (1964).

HENNING, G. "Meeting the Teacher Shortage", Technical Military Planning operation, General Electric Co., Santa Barbara, (1957).

HICKEY, ALBERT E., "Programmed Instruction in Business & Industry", API, (1962), pp.282-293.

HILGARD, E. R. Theories of Learning, Second Edition, NY, Appleton-Century-Crofts, (1956).

HILGARD, E. R. "Learning Theory and its applications", New Teaching Aids for the American Classroom, (1960).

HILGARD, ERNEST R., "What support from the Psychology of Learning", National Education Association Journal, 50, (1961), pp.20-21.

HIRSCH, R. S. The Effects of Knowledge of Test Results on Learning of Meaningful Material, Special Devices Centre, Office of Naval Research, (1952), Technical Report SDC 269-7-30.

HIRSCH, R. S. "Mechanical Aids in Language Teaching", Monograph Series on Languages and Linguistics, 4, (1953), pp.58-63.

HITT, W. D. "Basic questions on automated teaching", il. Ohio Sch., 41, (1963), pp.10-11.

HIVELY, W., "Implications for the Classroom of B.F. Skinner's Analysis of Behavior", Harvard Educational Review, 29, (1959), pp.37-42.

HOEHN A. J. and LUMSDAINE, ARTHUR A., "Design and Use of Job Aids for Communicating Technical Information", AFPTRC-TR-58-7, (ASTIA 152109), TMPI 639.

HOBAN C. F. "The Usable Residue of Educational Film Research", New Teaching Aids for the American Classroom, (1960), pp.95-115.

HOBAN C. F. and VAN ORMER E. G. Instructional Film Research 1918-1950, Special Devices Centre, Office of Naval Research, (1950), Technical Report SDC 269-7-19.

HOLLAND , J. G. "Design and Use of a Teaching-Machine Program", Paper read at Annual Convention of American Psychological Association, (1960).

HOLLAND, J. G. "Evaluating teaching machines and programs," Teach. Coll. Rec. 63, (1961), pp.56-65.

HOLLAND and PORTER DOUGLAS, "The Influence of Repetition of Incorrectly Answered Items in a Teaching Machine Program", Journal of Experimental Analysis of Behavior, 4, (1961), pp.305-307.

HOLLAND JAMES G., and SKINNER R. F. "A Self-Tutoring Introduction to a Science of Behavior", Psychological Labs., Harvard Uni., (1958).

HOLLINGWORTH H. L. Educational Psychology., NY, Appleton-Century-Crofts, (1933).

HOMME, LLOYD E. (ed.). "Research Notes", Automated Teaching Bulletin, 1, (1959), 1.

HOMME, L. E. and GLASER R., "Problems in Programming verbal learning sequences", A.A. Lumsdaine and R. Glaser (eds.), Teaching Machines, and Programmed Learning, (1960), pp.486-496.

HORN, R. E. "The Rhetoric of Programming", *Programmed Instruction*, 2, (1963), p.4.

HORSMAN, DONALD L., "Instruction Principles Outlined", *Bulletin to the Schools*, (1961), pp.155-158.

HORTON L. W. "New Mathematics and programmed learning: What the Roanoke Teachers are Saying", *il. Av. Instr*., 7, (1962), pp.154-5.

HOTH, WILLIAM E. "From Skinner to Crowder to chance a primer on Teaching Machines", *Engl. J*. 50, (1961), pp.398-401.

HOUGH, J. B. "Evaluation - Analysis of the efficiency and effectiveness of selected aspects of machine instruction", Bibliog. *J. Ed. Res.*, 55, (1962), pp.467-71.

HOUGH, J. B. "Research vindication for teaching machines", *Phi Delta Kappan*, 43, (1962), pp.240-242

HOUGH, J. B. and REVSIN B., "PI at the college level: A Study of several factors influencing learning", *Phi Delta Kappan*, 44, (1963), pp.286-91.

HOUNTRAS, F. T. and BELCASTRO, F. P., "Construction - Comparison of four techniques of programming algebra", Bibliog, *Sci. Ed.*, 47, (1963), pp. 388-93.

HOUSTON J., "External Control in programmed learning", *Overview*, 3, (1962), pp.32-4.

HOVLAND, C. I. "Human Learning and Retention", *Handbook of Experimental Psychology*, (1951.)

HOVLAND, C. I. "A 'Communication Analysis' of Concept Learning", *Psychological Review*, 59, (1952), pp.461-72.

HOVLAND, C. I. "A Set of Flower Designs for Experiments in Concept Formation", *American Journal of Psychology*, 66, (1953), pp.140-42.

HUFFMAN H., and MARGULIES S., "Teaching Machine Program for a topic in business math.", *Bsns. Ed. World*., 41, (1961), pp.16-21.

HUGHES, J. H., "The Effectiveness of Programmed Instruction: Experimental Findings for 7070 Training", *Programmed Instruction* 1, (1961).

HUGHES, *Programmed Instruction for Schools and Industry*, Science Research Associates Inc., Chicago, (1962).

HUGHES, JOHN L., "Changes of Format and Reduced Time", *The Journal of Programmed Instruction*, 1, (1962), pp.43-54.

HUGHES J. L. and MC NAMARA W. J., "Comparative study of programmed and conventional instruction in industry", *J. Ap. Psychol*., 45, (1961), pp.225-31.

HUGHES, J. L. and MC NAMARA, W. J. "The Potential of Programmed Instruction", *Personnel*, 38, (1961), pp.59-67.

HUGHES, P. W. "Pilot studies in PI in Tasmanian Schools", *Curric. News*, 2, (1963), pp.342-7.

HUGHES, P. W. "Pilot studies in PI in Tasmanian Schools", Curric. News, 2, (1963), pp.342-347.

HUGHES, P. W. "Programmed Learning," Tas. Ed., 15, (1963) ,p.148.

HULL, C. L. Principles of Behavior, NY, Appleton-Century-Crofts, (1943).

IMUS, H. A.; ROTHNEY, J. W. and BEAR, R. M. An Evaluation of Visual Factors in Reading, Dartmouth College Publications, (1938).

INGRAHAM, L. W. "Evaluation - Programmed instructional materials in social studies", (1963), Social Ed., 28, (1964), pp.15-17 +.

IRION, A. L. "An Investigation of Four Modes of Operation and Three Types of Learning Tasks on the Improved Subject Matter Trainer", Unpublished Paper, Maintenance Lab., AFPTRC, Lowry Air Force Base, (1957).

ISRAEL, M. L. "Skinnerian Psychology and Educational Redesign", Paper read at 1958 Symposium sponsored by American Psychological Asscn. Committee on Relations Between Psychology & Education, Washington, (1958).

ISRAEL, M. L. "Educational Redesign: A Proposal", School Review, 67, (1959), pp.292-304.

ISRAEL, M. L. "Variably Blurred Prompting: 1., Methodology and Application to the Analysis of Paired-Associate Learning", Journal of Psychology, 50, 91960), pp.43-52.

JANSEN, ANDRE, "L'Enseignement des langues vivantes par les moyens audio-visuelles", Rotary International, 19, (1962).

JASPEN, N. Effects on Training of Experimental Film Variables, Study 2, Verbalization, 'How-it-works', Nomenclature, Audience Participation, and Succinct Treatment , Special Devices Centre, Office of Naval Research, (1950), Technical Report SDC 269-7-11.

JENKINS W. J. "Listening and Machines", El Engl., 37, (1960), pp.409-410.

JENSEN, ARTHUR R., "Teaching Machines and Individual Differences", Automated Teaching Bulletin, 1, (1960), pp.3.

JENSEN, B. T. "An Independent Study Laboratory using self-scoring tests", Journal of Educational Research, 43, (1949), pp.134-137.

JOHNSON D. A. "Teaching Machines and programmed learning", Sch. Sci. & Math., 62, (1962), pp.157-62.

JONES, H. L. and SAWYER M. O. "A New Evaluation Instrument", Journal of Educational Research, 42 (1949), pp.381-85.

JONES, N. F. "A 'Motorized' Reading Project", English Journal, 40, (1951), pp.313-19.

JONES, R. M. "Programmes and Teaching Machines", Teacher in Wales, 5, (1965), pp.21-24.

JACOBS, LUCY THORNTON, "The Influence of teaching Machine Procedures upon learning in High School Chemistry", Ph D. Dissertation, Uni. of Indiana, (1961).

JACOBS, P. I. "Some implications of testing procedures for auto-instructional programming", Princeton, N.J., E.T.S., (1962).

JACOBSON, JOHN JR., "Teaching High School students at College Level course by means of a learning machine program", Mid-Hudson Channel, 10, (1961), p.14.

JANSER, M. M. "What the Philadelphia schools are doing about automation", AM BSNS. Ed., 17, (1960), pp.37-9.

JONES, R. S. "Integration of Instructional with Self-scoring Measuring Procedures", Abstracts of Doctoral Dissertations, 65, (1954), pp.157-165.

JOHNSON, PATRICK, "The educational implications of teaching machine and programmed learning", Visual Education, (1963), pp. 2-5.

JORDAN, J. A. "Socratic Teaching?", Harvard Ed. Rev., 33, (1963), pp.96-104, 383-5.

KANNER, J. H.; RUNYON R. P., and DESIDERATO O., "Television as a Training and Educational Medium", Audio-Visual Communication Review, 3, (1955), pp.163-72.

KANNER, J. H. "The Development and role of teaching aids in the armed forces", Schramm W., (ed.), New Teaching Aids in the American Classroom, Stanford Uni. Press (1960).

KATZ, M. S. and STAUFFER C. B. "The application of Programmed teaching methods to defense products training", General Electric Co, Teaching Information Series, (1960).

KAULFERS, W. V. "Earmarks of a good foreign language program", Calif. J. Sec. Educ., 31, (1956), pp.4-13.

KAY, H. "For the teacher's sake?", The Times Educational Supplement, (1964), pp.971.

KAY, HARRY, "General Introduction to teaching machine procedures", Austwick Kenneth (ed.), Teaching Machines and Programming, (1964), pp.1-42.

KAY, HARRY, "Teaching Machines", Nature, 192 (1961), pp.105-106.

KAY, HARRY,; ANNETT, JOHN and SIME MAX E., "Teaching Machines and their use in Industry", HMSO, (1963), pp.32.

KELLER, F. S. and SCHOENFELD, W. N. Principles of Psychology, NY, Appliton-Century-Crofts, (1950).

KEEVES, JOHN P., "Experimental Research", ACER, (1962).

KEEVES, J. P. "Learning and PI", Curric. News, 2, (1962),pp.19-27.

KEEVES, JOHN P., "Notes on Learning and Programmed Instruction", ACER, (1961).

KEEVES, J. P. "Review of Experimental Research in PI", Curric. News, 2, (1963), pp.116-21.

KEEVES, J. P. "A Review of PI", A.C.E.R., (1962).

KEISLAR E. R. "Development of understanding in arithmetic by a teaching machine", Bibliog., J. Ed. Psychol., 50, (1959),pp.247-53.

KEISLAR EVAN R., and MC NEIL JOHN D., "A Comparison of Two Response Modes in an Auto-instructional program with Children in the Primary Grades", American Psychological Asscn., (1961).

KEISLAR EVAN R. "Potential of auto-instruction", Am.Voc.J., 36, (1961), pp.36-7+.

KEISLAR, EVAN R., "Programming for Transfer: A Mediational Approach", PIP, (1963).

KEISLAR EVAN R., "Theoretical aspects of automated teaching", Read at Annual Convention of Western Psychological Asscn., San Diago, (1959).

KELLER, FRED. S., "Discussion of Automated Teaching", Read at APA Meeting, Chicago, (1960).

KEMP, JERROLD, E., "Learning about self-instruction", AV Instruction, (1961).

KERSH, BERT Y., "Programming Classroom Instruction", DE CECCO, (1964), pp.306-314.

KETTELKAMP, G. C. Which step first? The Relation of sequence to Language Achievement, Urbana: Bur. of Res. & Service, Uni. of Illinois, (1949).

KIMBLE, G. A. and WULFF, J. J., The Effect of 'Response Guidance' on the Value of Audience Participation in Training Film Instruction, Air Force Human Factors Operations Research Laboratories (1953), (HFORL Report No. 34).

KIMBLE, GREGORY A., and WULFF J. JEPSON, "The Effectiveness of instruction in reading a scale as influenced by the relative amounts of demonstration and problem-solving practice", SPI, (1961), pp.227-240.

KIMBLE, GREGORY A., and WULFF J. JEPSON, "Response Guidance' as a factor in the value of student participation in film instruction", SPI, (1961), pp.217-226.

KING, R. "Texas- Trends in Texas", Tex. Outl., 47, (1963),pp.37-8.

KINGSLEY, H. L. The Nature and Conditions of Learning, Second Edition, Englewood Cliffs NY, Prentice-Hall, (1957).

KLAUS, D. J. (in collaboration with Holmok E.S., Lumsdaine A.A., Meyer D.S. and Quisenberry K.S.), High School Physics, (A two-volume programmed text: Vol 1, Introduction and Static Electricity, p.545+; Vol. 2, Reflection and Refraction p.720+.), American Institute for Research, (1960).

KLAUS, D. J. "Programming: A Re-emphasis on the Tutorial Approach", Audio-visual Instruction, 6, (1961), pp.130-48

KLAUS, DAVID J., "Some observations and findings from Auto-Instructional Research", American Institute for Research, Pittsburgh, (1960).

KLEINMEYER J., "Programmed Instruction for basic typewriting", Am. Bsns. Ed. Yrbk., (1963)., pp.280-4.

SLIGER, S., "Workbook and the programmed text", Engl. J., 52, (1963), pp.674-6.

KLUGH, H. E.; DETERLINE W. A.; and HENDERSON D. E., "A Note on the Teaching of Skinner's Descriptive Behaviorism in the fifth grade", Journal of Educational Psychology, 51, (1960), pp.74.

KNEELAND R., an CUMMING J. "Western's workshop on teaching machines and programmed learning", Mont. Ed., 39, (1962), pp.19-20.

KNUDSEN, T. W. "Consider the monotype", il. Arts & Activities, 54, (1963), pp.30-2.

KOMOSKI, P. KENNETH, "Automated teaching project", Collegiate School Centre for PI, (1960).

KOMOSKI, P. KENNETH, "Call it PI - not a teaching machine", Mid-Hudson Channel, 10, (1961), pp.9-13.

KOMOSKI, P. KENNETH, "The Collegiate School Conference", Audio-Visual Instruction, 6, (1960), pp.140-141.

KOMOSKI, P. KENNETH, "Current Development and Experimentation in the Field of Programmed Instruction", National Education Asscn. Journal Paper Articles on Programmed Instruction, pp.14.

KOMOSKI, P. KENNETH, "An immodest proposal concerning the use of PI in emerging nations",PIP, (1963).

KOMOSKI, P. KENNETH, "Origin of Collegiate School Automated Teaching Project" Report Collegiate School, (1960).

KOMOSKI, P. KENNETH, "Programmed Instruction and its place in Education", Articles on Programmed Instruction, (1960), pp.16.

KOMOSKI, P. K. "Programmed instruction and its place in education", In Educational Conference (1960), Measurement and Research in today's Schools, pp.122-32.

KOMOSKI, P. K. "PI: A Prologue to what?", Phi Delta Kappan, 44, (1963), pp.292-295.

KOMOSKI, P. KENNETH, "PI - Expandable or expendable?", Programmed Instruction, 1, (1961), pp.2, 3, 6.

KOMOSKI, P. KENNETH, "Programming by Teachers for the School Curriculum", American Psychological Association Meetings, (1961), pp.7.

KOMOSKI, P. KENNETH, "Programmed Materials", The Nations Schools, 67, (1961), pp.74-75.

KOMOSKI, P. K. and GREEN E., with a note by W. Schramm, "PI in West Africa and the Arab States: A Report on 2 Training Workshops", UNESCO Ed. Studies & Docs., 52, (1964).

KOPSTEIN F.F. and ROCKWAY, M. "Self-Tutoring and Problems in Training", Paper read at Air Force Office of Scientific Research and the Uni. of Pennsylvania Conference on the Atuomated Teaching of Verbal and Symbolic Skills, Philadelphia (1958).

KOPSTEIN, F.F. and ROSHAL, S. M. "Learning Foreign Vocabulary from Pictures versus Words", Training Aids Research Laboratory, (1954).

KOPSTEIN F. F. and ROSHAL S. M. "Method of Presenting Word Pairs as a Factor in Foreign Vocabulary Learning", Paper Read at Annual Convention of American Psychological Asscn., San Francisco, (1955).

KOPSTEIN, FELIX F., and ROSHAL SOL M. "Verbal learning efficiency as influenced by the manipulation of representational response processes: Pictorial-verbal and temporary contiguity factors", SPI, (1961),pp.335-350.

KOWITZ, G. T. Teaching Machines - "Administering the automated school", il. Am. Sch. Bd. J., 142, (1961), pp.13-16.

KRUMBOLTZ, JOHN D., "Meaningful Learning and Retention: Practice and reinforcement Variables", Review of Educational Research, 31, (1961), pp.535-546.

KRUMBOLTZ JOHN D., "Needed Research in Programmed Instruction", Educational Leadership, 21, (1963), pp.30-33, 49.

KRUMBOLTZ, J. D. and WEISMAN, R. G. "The Effect of Intermittent Confirmation in Programmed Instruction", Journal of Educational Psychology, 53, (1962), pp.250-3.

KRUMBOLTZ, J. D. and WEISMAN, R. G. "The Effect of overt versus covert responding to programmed instruction on immediate and delayed retention", Journal of Educational Psychology, 53, (1962), pp.89-92.

KUNKEL, J. L. "I got another one right Miss Brown; Programmed instruction for retarded children", Bibliog., Av. Instr., 8, (1963), pp.580-1.

KURTZ, A. K. An Application of Learning Theories to the Training of Radio Code Operators, Technical Report No. 2, prepared for Office of Naval Research by Psychological Corporation (1959).

KURTZ, A. K.; WALTER J. S., and BRENNER, H. R. The Effects of Inserted Questions and Statements on Film Learning (Rapid Mass Learning), Special Devices Centre, Office of Naval Research, (1950), Technical Report SDC 269-7-16.

KURTZ, K. H. and HOVLAND C. I. "The Effect of Verbalization During Observation of Stimulus Objects upon Accuracy of Recognition and Recall", Journal of Experimental Psychology, 45, (1953), pp.157-64.

KVARACEUS, W. C. "Future classroom: An Educational Automat?", Ed. Leadership, 18, (1961), pp.288-92.

LAMADE, W., "Two Approaches to programming materials", Bibliog., Adult, Ed., 12, (1962), pp.84-90.

LASSER, S., "The Impact of Visual Aid Displays Showing a Manipulative Task", Quarterly Journal of Experimental Psychology, 6, (1954),pp.95-106.

LAUER, A. R.; HENRY, L. K. and FRITZ J. F., "Improving the Reading Ability of College Students", (Abstract), Psychological Bulletin, 35, (1938), pp.670.

LAWRENCE, R. E. Teacher Education -"Teachers teach as they are taught", il. Av. Instr., 8, (1963), pp.417-18.

LAWSON, CHESTER A., "A Suggestion for programming teaching machines", Report of Symposium on Tomorrow's Teaching,Frontiers of Science Foundation of Oklahoma, Indiana (1961).

LAWSON, C. A. and others, "Developing a scrambled book and measuring its effectiveness as an aid to learning natural sciences", Sci. Ed., 44, (1960), pp.347-58.

LAYBOURN, K. "PI: An Important Part of our future", Educational Development, 7, (1964), pp.12-15.

LEAHY, D. J. "Implications of automation for the teaching of science", Sci. Ed., 46, (1962), pp.304-9.

LEARNED, W. S. and WOOD B. D. The Student and His Knowledge, NY, Carnegie Corp., (1938).

LEAVITT, J. E. Programmed Learning and Teaching Machines, State Dept., of Education, Oregon (1961).

LEAVITT J. E. and LAMADE, W., "Programmed Learning ; Bibliog. and Programs", Instr., 72, (1963), pp.12+

LEBEDEV, P. D. Russia - "Problem requiring profound study", Soviet Ed., 5, pp.27-33.

LEITH, G. O. M. "Programmed learning in special education", Special Education, 52, (1963), pp.17-23.

LEONTIEV, A. N. and GALPERIN, P. "Learning Theory and Programmed Instruction", Soviet Education, 7, (1965), pp.7-15.

LEVIN G. R. and BAKER B. L. "Item scrambling in a self-instructional program", J. Ed. Psych., 54, (1963), pp.138-143.

LEVINE, J. "Let's debate programmed reading instruction", Bibliog. Read. Teach., 16, (1963), pp.337-41.

LEVINSKY S., "Experiments with sound", Diags. Grade Teach,80, (1962), pp.28-9+.

LEVINSKY S. "Members of Congress", Grade Teach., 80, (1963), pp.32-3+.

LEWIS, D., and SHEPHARD A. H. "A New Device for Presenting Paired-Associates in Verbal Learning", American Journal of Psychology, 63, (1950), pp.600-606.

LINDQUIST, E. F. Design and Analysis of Experiments in Psychology and Education, Boston, Houghton Mifflin Co. (1953).

LINFIELD, ERIC, "Teaching Machines and programmed learning ,Some criticisms and reflections", Forum, (1964), pp.57-58.

LOFTS, K. G. "A Controlled Experiment in Programmed Teaching", Education Gazette, 58, (1964), pp.65-67.

LITCHFIELD M. "Now I Use The Tachistoscope", Audio-Visual Guide, 19 (1953). pp.25.

LITTERER, O. F. "An Experimental Study of Visual Apprehension in Reading", Journal of Applied Psychology, 17, (1933), pp.266-76.

LUMSDAINE, A. A. "Possibilities and Implications of Automated Teaching Methods", Paper Read at Symposium on Automation of Teaching at Annual Convention of American Psychological Asscn., (1958).

LUMSDAINE, A. A. "Partial and More Complete Automation of Teaching in Group and Individual Learning Situations", Automatic Teaching: The State of the Art, (1959), Chap. 13, p.147-66.

LUMSDAINE, A. A. "Response Cueing and'Size-of-Step' in Automated Learning Programs", Paper read at Symposium on Research Issues in the Study of Human Learning Raised by Developments in Automated Teaching Methods, American Psychological Asscn. Convention, Cincinnati (1959).

LUMSDAINE, A. A. "Teaching Machines and Self-Instructional Materials", Audio-Visual Communication Review, 7, (1959), pp.163-81.

LUMSDAINE, A. A. and GLADSTONE, A. I. "Overt Practice and Audio-Visual Embellishments", Learning from Films, (1958), pp.58-71.

LUMSDAINE A. A. and ORR D. B. Preliminary Evaluative Studies of Science Telecasts, American Inst. for Research, (1958).

LUMSDAINE, ARTHUR A., "The Analysis of Student Response as a Factor in Instruction", Symposium on Programmed Instruction (1961).

LUMSDAINE, A. A. "Criteria for evaluating self-instructional programs", Bibliog. f.Sch. Life, 45, (1962), pp.14-17+.

LUMSDAINE ARTHUR A. "Some critical issues on the Improvement of Instruction through Programmed Learning", AV Communication Review, 10, (1962), pp.61-4.

LUMSDAINE, ARTHUR A. "Some differences in approach to the programming of instruction", Programmed Learning: Evolving Principles and Industrial Applications (1961).

LUMSDAINE, A. A. "Some Issues Concerning Devices and Programs for Automated Teaching", Teaching Machines and Programmed Learning, (eds.), A.A. Lumsdaine and R. Glaser, National Education Assoc., Dept. of Audio-Visual Instruction, (1960), pp.517-39.

LUMSDAINE, ARTHUR A. "Some Problems in assessing Instructional Programs", PIP, (1963).

LUMSDAINE, ARTHUR A., "Some theoretical and practical problems in PI", (Coulson John E.), Programmed Learning and Computer-based Instruction, Wiley, NY, (1962), pp.134-149, abridged De Cecco, (1964), pp.77-91 Bibliog.

LUMSDAINE, ARTHUR A., "Student Response in Programmed Instruction", A Symposium on Experimental Studies of Cue and Response Factors in Group and Individual Learning from Instructional Media, National Academy of Sciences, National Research Council, 943, (1961), pp. ix + 555.

LUMSDAINE, ARTHUR A. "UNESCO Educational Media Conference recommendations", *AV Communication Review*, 10, (1962), pp.338.

LUMSDAINE, ARTHUR A.; SULZER RICHARD L. and KOPSTEIN FELIX F., "The Effect of animation cues and repetition of examples on learning from an instructional film", *SPI*, (1961), pp.241-270.

LUMSDAINE, ARTHUR A., and GLASER ROBERT, "Teaching Machines and Programmed Learning, A Source Book", *Dept. Audio-Visual Instruction, Nat. Educ. Asscn.*, (1960), 3rp (1961).

LUMSDAINE ARTHUR A. and KLAUS, D. J. Terminology - "What's in a name? A Problem of terminology", *AV. Comm. R.*, 9, (1961), pp.208-11.

LYSAUGHT, JEROME P., "A Commentary on the State of the Art", *AID*, (1961).

LYSAUGHT, JEROME P., The Future Face of Learning", presented before Rochester Section, Society of Motion Picture and Television Engineers, (1961).

LYSAUGHT, JEROME P. "Programmed Learning and Teaching Machines in Industrial Training", *API*, (1962), pp.23-43.

LYSAUGHT, JEROME P., "Programmed Learning and the Classroom Teacher", *New York State Education*, (1961).

LYSAUGHT, JEROME P. "Programmed Learning: Evolving Principles and Industrial Applications", *Foundation for Research on Human Behavior*, (1961).

LYSAUGHT, JEROME P., "Telling the Staff about programmed learning", Ed. Exec. *Overview*, 3, (1962), pp.34-5.

LYSAUGHT JEROME P., and WILLIAMS, CLARENCE M., "A Community explores Programmed Learning", *New York State Education*, 49, (1962), pp.24-7.

LYSAUGHT, JEROME P., and WILLIAMS, CLARENCE M., *A Guide to Programmed Instruction*, Wiley, NY, (1963), pp. ix + 180.

LYSAUGHT, JEROME P. and WILLIAMS, CLARENCE M. *Handbook on Programmed Instruction*, Wiley, NY (1962), (1963), pp.180.

MC AULAY, J. D. "Place of programmed learning in elementary school geogrpahy", Bibliog. *f. J. Geog.*, 61, (1962), pp.215-21.

MC CLELLAN, JAMES E., "PI and Philosophy of Education: Who's going to put whom out of business?", *PIP*, (1963).

MC CONNELL, J. V.; CUTLER R. L. and MC NEIL E. B., "Subliminal Stimulation: An Overview", *American Psychologist*, 13, (1958), pp.229-42.

MC GEOCH, J. A. *The Psychology of Human Learning: An Introduction*, NY, Longmans Green &Co. (1942).

MC GEOCH, J. A. and IRION A. L. *The Psychology of Human Learning*, Second Edition, Longmans, Green & Co. (1952).

MC LUHAN M. "What Fundamental Changes are Foreshadowed in the Prevailing Patterns of Educational Organization and Methods of Instruction by the Revolution in Electronics?", *Current Issues in Higher Education*, (1959), pp.176-82.

MC NEMAR Q. *Psychological Statistics*, Wiley & Sons (1949).

MACCOBY, N. and SHEFFIELD F. D. "Theory and Experimental Research on the Teaching of Complex Sequential Procedures by Alternate Demonstration and Practice", *Symposium on Air Force Human Engineering, Personnel and Training Research*, (1958). (ed.) G. Finch & F. Cameron.

MACCOBY, NATHAN, and SHEFFIELD FRED D., "Combining practice with demonstration in teaching complex sequences: Summary and Interpretation", *SPI*, (1961), pp.77-86.

MC CRARY, J. W. *Personal Communication* , Unpublished Experiment, Green (1956), pp.71-2.

MC CRYSTAL, THOMAS J. "Programmed instruction: A Plan for Research", Research Memorandum, US Army Infantry Human Research Unit, Fort Genning (1961).

MC CULLOUGH, CELESTE and VAN ATTA LOCHE, *The Use of miniature programs to supplement conventional teaching Techniques* , Oberlin College, Ohio, (1960).

MC DONALD F. and ALLEN D., "An investigation of presentation, response and correction factors in PI," *J.Ed. Res.*, 55, (1962),pp.502-507.

MC DONNEL, G. J. "Automated Teaching", *Growth Stock Review*, 31, (1960).

MC GUIRE, WILLIAM J. "Audience participation and audio-visual instruction overt-covert responding and rate of presentation", *SPI*, (1961), pp.417-426.

MC GUIRE, WILLIAM J. "Effects of serial position and proximity to 'reward' within a demonstrational film", *SPI*, (1961), pp.209-216.

MC GUIRE, WILLIAM J. "Interpolated motivational statements within a programmed series of instruction as a distribution of practice factor", *SPI*, (1961), pp.411-416.

MC GUIRE, WILLIAM J. "Some deleterious effects on a perceptual-motor skill produced by an instructional film: massing effects, interference, and anxiety", *SPI*, (1961), pp.177-186.

MC GUIRE, WILLIAM J. "Some factors influencing the effectiveness of demonstrational films: Repetition of instructions slow motion, distribution of showings, and explanatory narration", *SPI*, (1961), pp.187-208.

MC LAUGHLIN G. HARRY, "A Programme for PI", *Technical Education*, 5, (1963), pp.262-263.

MCLELLAN, J. "Automated Teaching: A Philosophical Approach", rp.

MC NEIL JOHN D., "Great Didactic and automated teaching", Bibliog. *Ed*., 81, (1961), pp.566-9.

MC NEIL, J. D. "Influence of programmed learning upon curriculum research", *Phi Delta Kappan*, 44, (1963), pp.261-4.

MC NEIL, JOHN D. "PI and the Elementary School Curriculum", *PIP*, (1963).

MC NEIL JOHN D., and KEISLAR E. R. "Individual differences and effectiveness of auto-instruction at the Primary grade level", *Californian Journal of Educational Research*, 12, (1961), pp.160-4.

MC NEIL J. D. and KEISLAR E. R. "Questions versus statements as stimuli to children's learning", *AV Communication Review*, 10, (1962), pp.85-88.

MC NEIL J.D. and KEISLAR, E. R. "Value of the oral response in beginning reading: An Experimental Study using PI,"*Brit. J. Ed. Psych*., 33, (1963), pp.162-168.

MAGER, ROBERT F., "Instructional program preparation by Specialist Collaboration", Varian Associates, Palo Alto., (1961).

MAGER, ROBERT F., "On the sequencing of instructional content", *Psychological Reports*, 9, (1961), pp.405-413.

MAGER, ROBERT F., "Preliminary Studies in automated Teaching", *IRE TRANSACTIONS ON EDUCATION*, (1959).

MAGER, R. F. "Teaching: Today and Tomorrow", *IRE Student Quarterly*, (1959), pp.31-37.

MAGER, ROBERT F., "Preparing Objectives for Programmed Instruction", Published by Fearon Publishers, San Francisco, (1961).

MAGER, ROBERT F., *What are teaching Machines doing to teaching?*, Varian Associates, Palo Alto, (1961).

MAGER, ROBERT F., and CLARK C., "Explorations in Student-Controlled Instruction", Ofiesh, G.D. and Meierhenry W.C. (eds.), *Trends in PI*, Nea Davi Washington (1964), pp.235-238.

MANOLAKES G. "The Effects of Tachistoscopic Training in an Adult Reading Program", *Journal of Applied Psycholody*, 36, (1952),pp.410-12.

MANSTEAD, STEPHEN, "The Impact of Schools and Industry", *Mechanisation in the Classroom*, (1963), pp.149-164.

MARGOLIUS, GARRY J. and SHEFFIELD, FRED D., "Optimum methods of combining practice with filmed demonstration in teaching complex response sequences: Serial learning of a mechanical-assembly Task", *SPI*, (1961), pp.33-54.

MARGOLIUS, GARRY J,; SHEFFIELD, FRED D., and MACCOBY, NATHAN, "Repetitive versus consecutive demonstration and practice in the learning of a serial mechanical assembly task", *SPI*, (1961), pp.87-100.

MARGOLIUS, GARRY J.; SHEFFIELD FRED, D., and MACCOBY, NATHAN, "Timing of demonstration and overt practice as a function of task organization", SPI, (1961), pp.101-106.

MARGOLIUS, G., and MACCOBY, N., "Methods of Combining Practice with Filmed Demonstration in Teaching Complex Response Sequences", Paper read at Annual Convention of the American Psychological Asscn., Chicago, (1956).

MARKLE, SUSAN M., The Compleat Programmer, Los Angeles (Privately Printed), (1963).

MARKLE, DAVID G., "Faulty Frames: In which it is demonstrated that a program that works may well be worthless", Programmed Instruction, 1, (1962), 6.

MARKLE, SUSAN MEYER, "Faulty Frames", Programmed Instruction, 1, (1961), Beulletin 2, 5-6.

MARKLE, SUSAN MEYER, PhD., "Individualizing Programmed Instruction: The Programmer's Part", Articles on Programmed Instruction, (1962), pp.16

MARKLE, SUSAN MEYER, "The Lowest Common Denominator: A Persistent Problem in Programming", Programmed Instruction, 2, (1963), 3.

MARKLE, S. M. "Teaching Machines versus programmers", il.Av. Comm. R., 10, (1962), pp.286-92.

MARKLE, S. M. "Programmed Materials: A Teaching Aid", Clearing House,
and R.M.Bossone, 38, (1963), pp.148-51.

MARMOR, I., Programmed Textbooks - "Programming practitioners relate variety of experiences: Teacher and English 2600 make a good Pair", Av. Instr., 8, (1963), pp.402-3.

MARRIMAN E., "Teaching Modern Mathematics by programmed instruction: Science research associates programmed textbooks", Nat.Cath. Ed. Assn. Bul., 60, (1963), pp.326-31.

MATHIEU, GUSTAVE, "Automated Language Instruction: A New Deal for Student and Teacher", Automated Teaching Bulletin, 1, (1959), pp.5-9.

MAYER, JOSEPH, "Progress in programmed instruction", Self-instruction project, Earlham College, Richmond, Ind.

MEADE, F. U. Elementary Schools - "Bonus programming", Grade Teach., 80, (1963), pp.62+.

MEADE, F. U. "Challenge of programmed learning", Grade Teach., 80, (1963), pp.36+.

MEADE, F. U. "Nonacademic programming", Grade Teach., 80, (1963), pp.50+.

MEADE, F. U. "Programmihg for Precision", Grade Teach., 80, (1963), pp.42+.

MEADE, F. U. "Programming Music Notation", Grade Teach., 80, (1963), pp.30+.

MEADE, F. U. "Teacher and the Program", Grade Teach., 80, (1963), pp.32+.

MECHNER, F., "A Teaching Machine Program on programmed instruction", Basic Systems Inc., NY., (1961).

MECHNER, F., COOK, D. A. and MARGULEES, S., "Introduction to PI", Basic Systems Inc., Broadway, NY.

MELARANGO, R. J. Results of Experiment on Negative Reinforcement in Automated Teaching, Santa Monica, Calif., System Development Corp., (1960)., SEE: "Effect of Negative Reinforcement in an Automated Teaching Setting", Psychological Reports., 7, (1960), pp.381-4.

MELLAN, IBERT, "Teaching and Educational Inventors", Journal of Experimental Education, 4, (1936), pp.291-300.

MELTON, A. W. "The Science of Learning and the Technology of Educational Methods", Harvard Educational Review, 29, (1959), pp.96-106.

MELTON A. W. "Some Comments on 'The Impact of Advancing Technology on Methods in Education' by Dr. Simon Ramo", (1959).

MENGER, K. "New Approach to Teaching Intermediate Mathematics", Science, 127, (1958), pp.1320-23.

MERZ, B., "Open Discussion (at seminar on mathematical education conducted by Aust. Maths Soc., Sydney University)", Aust.Maths.Teacher, 18, (1962), pp.95-96.

MEYER, R. E. High Schools - Programming practitioners relate variety of experiences: Programming, yes, but not to teach facts", Av. Instr., 8, (1963), pp.403-4.

MEYER, SUSAN R., "Report on the initial test of a Junior High-School Vocabulary Program", (1960), TMPI pp.229-246.

MEYER, S. R. "A Program in Elementary Arithmetic: Present and Future", Automatic Teaching: The State of the Art, (ed.) E.H.Galanter, (1959), pp.83-84., Chapter 6.

MICHAEL, D. N. Some Factors Influencing the Effects of Audience Participation on Learning from a Factural Film, Memorandum Report, Human Resources Research Lab., Headquarters Command, Bolling Air Force Base, Washington, (1951), HRRL-MR-13A.

MILES, M., L.G. GOTKIN and L.S. GOLDSTEIN, "Programmed Instruction in the Schools: Innovation and Innovator: Excerpts from Innovation in Education", Bibliog. Av. Comm. R., 11, (1963), pp.277-87.

MILLER, N. E. and others, "Graphic Communication and the Crisis in Education", Audio-Visual Communication Review, 5, (1957), pp.1-120.

MILLER R. B. Handbook on Training and Training Equipment Design, Wright-Patterson Air Force Base, Ohio: Wright Air Development Centre, (1953), WADC Technical Report 53-136.

MILLER, R. B. *Psychological Considerations for the Design of Training Equipment*, Wright Patterson Air Force Base, Ohio, (1954), WADC Technical Report No. 54-563.

MILLER, R. B. *A Study of Methods for Determining Conceptual Content of Technical Jobs for Training Purposes*, Pittsburgh, Pa., American Institute for Research (1955).

MILLER, R. B. *A Suggested Guide to Functional Characteristics of Training and Training Equipment*, Technical Memorandum, Maintenance Lab., AFPTRC, Air Research and Development Command (1956), (ML-TM-56-14).

MILLER, R. B. *Task and Part-Task Trainers and Training*, Wright-Patterson Air Force Base, Ohio, (1956), PADC Technical Report 56-41.

MILLS, A. L. (ed.). "Programmed learning and the educational process", Summary of a Conference held by Thomas Alva Edison Foundation & Grolier Inc., at Stanford California, (1961).

MITCHELL, M. B. *Education - A New Era Begins*, Reprint of a speech, Chicago, Encyclopaedia Britannica Films (1958).

MOLLOY, JULIA, "A Language Development Program for retarded children", Presented at Allerton Park Conference on Automation in Special Education, (1960).

MOON, HAROLD and KLEIN, CHARLES, "A Review of teaching machines and Programmed Learning", *Automated Teaching Bulletin*, 1, (1961), pp.10-12.

MOORE, O. K. and ANDREWS, A. R. "Early reading and writing: A Film report", Little Harbor, Milford, Conn., Basic Education, (1959).

MOORE, J. W. and SMITH W. I. "Motivation in automated instruction", *Sch. Life*, 46, (1963), pp.21-2.

MORRIS, S., "Programmed Learning: Implications for the Teacher", *Times Educational Supplement*, 2550, (1964), pp.841.

MORSH, J. E.; STANNARD, A.F.B.; and GRAHAM, C. R. "Studies in International Morse Code. V. The Vimy Adaptations of the Code-Voice Method for Initial Instruction in Morse Code Receiving", *Canadian Journal of Psychology*, 2, (1948), pp.42-44.

MOWRY, H. W., and WEBB. W. B. "Facilitation of Learning by the Classroom Communicator", *Studies in Air Technical Training*, (1955), (Technical Report No.2 Nonr. 816 (02).

MULLER, H. J. *The Uses of the Past*, New York: Oxford Uni.Press, (1957).

MUMFORD, L. *In the Name of Sanity*, NY., Harcourt, Brace and Co. (1954).

MUMFORD, L. "An Appraisal of Lewis Mumford's Technics and Civilization", (1934), *Daedalus*, (1959), (issued as Vol. 88 No. 3 of the Proceedings of the American Academy of Arts and Sciences), pp.527-36.

MUNN. N. L. "Learning in Children", *Manual of Child Psychology*, (1954), pp.374-458.

NASCA, D., "Have you tried a program yet?", *Sci.Ed.*, 47, (1963), pp.68-72.

NASCA, D. "Programmed Learning: Magnets and Magnetism", Instr., 72, (1962), pp.28.

NEAL, W. "Music makers", Grade Teach, 80, (1963), pp.30-1+.

NEALE, D. C. "Look before you leap", il. Minn J. Ed., 43, (1963), pp.16-17.

NEVILLE, L. E. "Split-Second Recognition: A New Allied Weapon", Aviation, 42, (1943?, pp.119, 382-85.

NEWMAN, S. E. "Student Versus Instructor Design of Study Method", Journal of Educational Psychology, 48, (1957), pp.328-33.

NEWTON, JOHN M., and HICKEY,ALBERT E. "Sequence effects in programmed learning of a verbal concept", Journal of Educational Psychology, 56, (1965), pp.140-147.

NORDBERG, R. B. "What is learned from automated instruction?", Bibliog., Childh Ed., 39, (1962), pp.168-70.

NOTTINGHAM, M. A. "What is the future of programmed learning?", il. CTA J., 59, (1963), pp.21+.

NUNN, GLADYS, "An English teacher looks at programmed learning", Aduiovisual Instruction, 6, (1961), pp.441-442.

O'CONNOR, V. J. "An Examination of Instructional Films for Characteristics of an Effective Teaching Presentation", Harvard Educational Review, 20, (1950), pp.271-84.

O'DONNELL, E. J. "Writing programmed materials for use in teaching machines: Classroom teacher", Chicago Sch. J., 44, (1963), pp.353-8.
OFIESH, GABRIEL D., "Educational Technology in the USAF", The American Behavioral Scientist, 6, (1962), 3 .

OFIESH, G. D. and MEIERHENRY, W. C. Trends in Programmed Instruction, 1964, Papers from the first annual convention of the National Soc. of Programmed Instruction and National Education Asscn.

OLDS, R., "Automated education", il. Ohio Sch. 38, (1960), pp.8-9.

OLIVER J. W. History of American Technology, NY, Ronald Press, (1956).

O'NEILL J. C. "Men, Machines and Conversation Courses", French Review, 26, (1953), pp.439-45.

ORBISON, W. D. The Relative Efficiency of Whole and Part Methods of Learning Paired-Associates as a Function of the Length of List", Doctor's thesis, New Haven, Yale Uni. (1944).

OTTERNESS, J. and others, "Minnesota -"Is programmed learning effective?", Minn.J. Ed., 44, (1963), pp.32

PASK, G. "Teaching Machines", Unpublished paper, Solartron Electronic Group, Ltd., (1958).

PASK, G., "Adaptive Teaching with Adaptive Machines", (1960), pp.349-66.

PAWDA, DAVID J., "Dimensions of the Need", The American Behavioral Scientist, 6, (1962), 3.

PEATLING, J. H. "Media teaching and group dynamics", il. Int. J. Relig. Ed., 40, (1964), pp.24-5+

PERKY, C. W. "An Experimental Study of Imagination", American Journal of Psychology, 21, (1910), pp.422-52.

PERRY, W. G. Jr., and WHITLOCK C. P. "A Clinical Rationale for a Reading Film", Harvard Educational Review, 24, (1954), pp.6-27.

PHILLIPS, E. LAKIN, "A Multipurpose programmed Reading Series", Read at the APA Meeting (1961).

PHILLIPS, J. L. Jr. "Perception in Number Skills: A Study in Tachistoscope Training", Journal of Educational Psychology, 45, (1954), pp.459-68.

PINES, MAYA, "How Three-year-olds teach themselves to read - and love it", Harper's Magazine, (1963).

POPHAM, W. J. "Changing face of programmed instruction", Bibliog., Calif. J. El.Ed., 31, (1962), pp.112-23.

POPP. HELEN M. and PORTER, DOUGLAS, "Programming verbal skills for primary grades", AV Communication Review, (1960).

PORTER, D. "A Critical Review of a Portion of the Literature on Teaching Devices", Teaching Machines and Programmed Learning, (eds.) A.A. Lumsdaine and R. Glaser, (1960), pp.114-32.

POPPLETON P. K. and AUSTWICK, KENNETH, "A Comparison of programmed learning and note-making of two age levels", British Journal of Educational Psychology, 34, (1964), pp.43-50.

POSTELTHWAIT, S. N. Colleges and Universities - "Practical Audio-programmed instruction", il., Ed. Screen Av.G., 43, (1964),pp.82

PRESSEY, S. L. "The Influence of Color upon Mental and Motor Efficiency", American Journal of Psychology, 32, (1921), pp.326-56.

PRESSEY, S. L. Educational Acceleration: Appraisals and Basic Problems, Bureau of Educational Research Monograph 31, The Ohio State Uni. (1949).

PRESSEY, S. L. and HANNA, D. C. "The Class as a Psyoho-Sociological Unit", Journal of Psychology, 16, (1943), pp.13-19.

PRESSEY, S. L.; ROBINSON F. P. and HORROCKS, J. E., Educational Psychology, New York, Harper & Bros., (1959).

PROBST, G. E. "Programmed learning in the schools: Tasks for 1962", il, Sci. Teach, 29, (1962), pp.34-5+

RABINOWITZ, W. and MITZEL, H. E. "Programming in education and teacher preparation", Bibliog., Teach.Col. Rec., 64, (1962),pp.128-38.

RAMO, S. "A New Technique of Education", Institute of Radio Engineers Transaction on Education,E-1, (1958), pp.37-42.

RAMSEY, C. P. "Curriculum issues in programmed instruction", Bibliog., Ed., 83, (1963), pp.412-15.

REA, R. G. and GRAY, J. W. "Teaching parliamentary procedure through programmed instruction", Bibliog., f. Speech Teach., 13, (1964), pp.21-4.

REED, J.E. Programmed Teaching - "Aid for the teacher of English", Engl. J., 50, (1961), pp.93-7.

REED, J. E. and HAVMAN, J. L. Jr., "Experiment involving use of English 2600 and automated instruction text", J. Ed. Res., 55, (1962), pp.476-84.

REED, M. S. "Programming practitioners relate variety of experiences: Problems of Research", il. Av. Instr., 8, (1963), pp.400-2.

REED, WATFORD, "Dr. Eugene Calanter's Speech at the National Association of Secondary School Principals", OREGONIAN, (1960).

REEVES, T. M. "Programmed instruction for adult learners", Adult Ed., 13, (1962), pp.59-61.

REID, J. M. Construction - "Adventure in programming literature", Engl. J., 52, (1963), pp.659-73.

REID, L. S. "The Development of Noncontinuity Behavior Through Continuity Learning", Journal of Experimental Psychology, 46, (1953), pp.107-12.

REID, L. S. "A Review of automatic teaching, the state of the art", (ed.) E.H. Galanter, Science, 131, (1960), pp.29-30.

REINER, W. B. "Programmed learning a useful tool for the science educator: Guide to instruction programs", Sci. Teach., 29, (1962), pp.33.

REISS, F. A. "German Syntax on the Screen", MLJ, 35, (1951), pp.135-38.

RENSHAW, S. "The Visual Perception and Reproduction of Forms by Tachistoscopic Methods", Journal of Psychology, 20, (1945 ), pp.217-35.

RESNICK, L. E. "PI and the Teaching of complex intellectual skills: Problems and Prospects", Harv. Ed. Rev., 33, (1963), pp.439-471.

REYNOLDS, JAMES H., and GLASER, ROBERT, "Effects of Linear and Spiral Programming upon Amount and Variability of Learning", (De Cecco, John P.), Educational Technology: Readings in PI Holt, (1964), pp. xiv + 479, 164-169.

RHEEM CALIFONE CORPORATION, Automated Teaching Bulletin, 1, (1959), pp.1-28.

RHEEM CALIFONE CORPORATION, Automated Teaching Bulletin 2, (1959).

RIDER, M.Z Programs, Printed - "Program notes", Sch. Musician, (1962), pp.30-1.

RIEDESEL, C. A. Sample Programs - "In Slow Gear: on Teaching Arithmetic to slow learners", ..... 78, (1963), pp.28.

RIGNEY, JOSEPH W., and FRY EDWARD B., "Current Teaching-Machine Programs and Programming Techniques", Audio-Visual Communication Review, Suppl., 3, (1961).

RIGNEY, JOSEPH W.; BRYAN G. L. and SVENSON D. W., "The Multiple choice item as a training device", Read at Annual Convention of the American Psychological Asscn., Chicago, (1956).

RILEY, SUSAN B., "Mr. Gradgrind and Girl Number Twenty", National Education Asscn. Journal, 50, (1961), pp.22-25.

RITCHIE, M. L. and MICHAEL A. L. "Transfer Between Instrument and Contact Flight Training", Journal of Applied Psychology, 39, (1955), pp.145-49.

ROBERSON, PAUL L., "High Standards Needed", NSPI Journal., 2, (1963), 10.

ROBERTA, SISTER CLARE, Programs - "Classroom flag raising", il.Cath.Sch. J., 61, (1961), pp.44.

ROBINSON D., and SIEGAL J. "Automated Teaching: History, Principles and Application", Columbia Uni. Electronics Research Labs., Technical Report T-1/158, (1960).

ROBINSON F. P. "The Tachistoscope as a Measure of Reading Perception", American Journal of Psychology, 46, (1934), pp.132-35.

ROBINSON, H. M. "Tachistoscope in Reading", Elementary School Journal, 54, (1954), pp.490-91.

ROE, ARNOLD, "Automated teaching methods using linear programs", Report Nos. 60-53 and 60-105. Automated learning research project, Uni. of Calif.Dept. Engineering, Copies available from author.

ROE, A. "Automated Teaching Methods using linear programs", Journal of Applied Psychology, 46, (1962), pp.198-201.

ROE, A. "Comparison of branching methods for programmed learning", Bibliog., il.diags, J.Ed.Res., 55, (1962), pp.407-16.

ROE, ARNOLD,; MASSEY, MILDREN; WELTMAN GERSHON and LEEDS, DAVID., "Automated teaching methods using linear programs", Uni. of California Dept. of Engineering, Los Angeles, Report No. 600105, (1961).

ROE, ARNOLD; LYMAN, JOHN and MOON, HAROLD, "The Dynamics of an automated teaching system", API, (1962), pp.129-142.

ROE, ARNOLD and CASE HARRY W., "An evaluation of autoinstructional techniques" Read at APA Meeting (1961).

ROE, KIKI VLACHOLI, "Scrambled vs Ordered sequence in Autoinstructional Programs", Report 48, UCLA Dept. of Engineering, (1961).

ROE, KIKI VLACHOLI; CASE HARRY, and ROE ARNOLD, "Scrambled versus ordered sequence in autoinstructional programs", Journal of Educational Psychology, 53, (1962), pp.101-104.

ROGERS, C. R., and SKINNER, BURRHUS FREDERIC, "Some Issues concerning the Control of Human Behavior", - A Symposium", Science, 124, (1956), pp.1060-1064.

ROGERS, K. G. "Views from the top seminar on programmed learning USOE", Av. Instr., 8, (1963), pp.98-100.

ROOT, R. T. An Annotated Bibliography of Research on Training Aids and Training Devices, Staff Memorandum, Training Methods Division, HumRRO, George Washington Uni., (1957).

ROSE, BRIAN, "Second thoughts about PI", Education for Teaching, 62, (1963), pp.26-29.

ROSHAL, S. M. Effects of Learner Representation in Film-Mediated Perceptual-Motor Learning, Port Washington NY, Special Devices Centre, Office of Naval Research (1949), Technical Report SDC 269-7-5.

ROSS, T., "Values of our home room programs", Sch.Activities, 32, (1961), pp.168.

ROSS, WILBUR, L. "The Industrial Market for PI", API, (1962), pp.189-197.

ROTH, R. H. "Student reactions to programmed learning", Phi Delta Kappan, 44, (1963), pp.278-281.

ROTHKOPF, E. A. "A Deduction from an Excitation-Inhibition Account of Retroactive Inhibition", Journal of Experimental Psychology, 53, (1957), pp.207-13.

ROTHKOPF, E. Z. "Signal Similarity and Optimal Signal Arrangement of Lesson and Drill Orders in Alphabetic Morse Code Training", Symposium on Air Force Human Engineering, Personnel and Training Research, 516, (1958), pp.188-93.

ROTHKOPF, ERNST Z., "Acquisition of Equivalences", The Journal of Programmed Instruction, 1, (1962), pp.19-28.

ROTHKOPF, E. Z. "Do-it-yourself kit for programmed instruction", Biblieg., Teach.Col. Rec., 62, (1960), pp.195-201.

ROTHKOPF, ERNST Z., "Heuristic discussions of the psychological bases for conduct of training by automatic devices: A Functional diagram and an approach to research", Teaching Machines and Programmed Learning, (1960, 3rp 1961).

ROTHKOPF, ERNST Z., "Some Observations on Predicting Instructional Effectiveness by Simple Inspection", Journal of PI, 2, (1963), 2.

ROTHKOPF, ERNEST Z., "Some research problems in the design of materials and devices for automated teaching", Read at Symposium on automated teaching at the annual convention of the American Psychological Asscn., (1958), pp.318-328.

ROTHKOPF, ERNST Z., "The State of an Art?", Contemporary Psychology, 5, (1960), pp.104-105.

ROTHWELL, KENNETH S., "Programmed Learning: A back door to Empiricism in English Studies", *College English*, (1962).

RUFSWOLD, MARGARET I., "Library education and the newer media", Ala Bulletin, (1961).

RUSHTON, E. W. "Greatly accelerated learning of algebra through use of programmed materials", *The Nations Schools*, (1961).

RUTHERFORD G., (ed.), *Programmed Learning and its Future in Canada*, Report of a seminar held by the Canadian Teachers' Federation at Ottawa, (1961).

SALTZMAN, I. J. "Delay of Reward and Human Verbal Learning", *Journal of Experimental Psychology*, 41, (1951), pp.437-39.

SANBORN, W. B. "Some practical pointers on programming", *Ed.Screen Av. G.*, 41, (1962), pp.139-41+.

SAWYER, R., and WHITE E. H. "Programmed learning", *il.Instr.*, 71, (1962), pp.46A-46D.

SAX, G. *Concept Acquisition as aFunction of Differing Schedules and Delays of Reinforcement*, Doctor's thesis, Los Angeles: Uni. of S.California (1958).

SCHRAMM, WILBUR, "Introduction: Interim Report", *Four Case Studies of Programmed Instruction*, (1964), pp.119.

SCHRAMM. W.; KOMSOKI, P. K. and GREEN E., "PI in West Africa and the Arab States", *UNESCO ed. Studies and Docs.*, 52, (1964).

SCHRAMM, WILBUR L. "Programmed teaching with or without machines", *Art Ed.*, 16, (1963), pp.23.

SCHULTZ, RICHARD E., "Progress and preparation of automated instructional materials and criterion measures", *Automated Teaching Bulletin*, 1, (1959), pp.31-33.

SCHULTZ, R. E. and BAKER R. L. Teacher Education - "Programmed Learning and the teacher education curriculum", Bibliog. *Av. Comm R.*, 11, (1963), pp.253-9.

SCHWEICKHARD, D. M. "Electronics in public schools", *Minn.J. Ed.*, 41, (1961), pp.20-1.

SCOTT, J. C. "Lecture series for young listeners", *il.Mus.Educators J.*, 46, (1960), pp.31-2.

SEVERIN, D. G., "Appraisal of Special Tests and Procedures Used with Self-scoring Instructional Testing Devices", *Abstracts of Doctoral Dissertations*, 66, (1955), pp.323-330.

SHAFER, S. M. "Teaching machines and the social studies", *Social Ed.* 25, (1961), pp.85-6.

SHAHAN, R. M. "Spanish-American supper", *Sch. Activities*, 32, (1961), pp.232.

SHAY, CARLETON B., "The Relationship of Intelligence to Step Size on a Teaching-Machine Program", Journal of Educational Psychology, 52, (1961), pp.98-103.

SHORT, J. Aims and objectives - "Goals of programmed instruction", Grade Teach., 80, (1962), pp.28+.

SHORT, J. "New Ways to Teach", Grade Teach., 80, (1962), pp.28+.

SIERIES, S., "Slow learner can learn", Clearing House, 36, (1962), pp.361-3.

SILBERMAN, HARRY F., "The Automation of Teaching", Behavioral Science, (1960).

SILBERMAN H. "Branching versus Fixed Sequence Program", Paper presented at American Educational Research Assn., (1961).

SILBERMAN, HARRY F., "Research on programmed instruction at SDC", il. Sch. Life, 45, (1963), pp.13-15+.

SILBERMAN HARRY F., "Results of studies on effectiveness of automated instructions", Read at APA Meeting (1961).

SILBERMAN, HARRY F., "Trends in PI - an improvement in Educational technology", PIP, (1963).

SILBERMAN, H. F. "What are the limits of PI?", Phi Delta Kappan, 44, (1963), pp.296-8.

SILBERMAN H. F.; MELARAGNO R. J. and COULSON J. E., "Confirmation and prompting with connected discourse material", Psychological Reports, 9, (1961), pp.235-238.

SILBERMAN H. F.; MELARAGNO R. J.; COULSON J. E. and ESTAVAN D., "Fixed sequence versus branching autoinstructional methods", Journal of Educational Psychology, 52, (1961), pp.066-72.

SILVERMAN, R. E., Automated Teaching: A Review of Theory and Research, U.S. Naval Training Devices Centre, (1960).

SILVERN LEONARD C., "Best of Silvern: Some thoughts on programmed learning", Ed. Exec. Overview, 4, (1963), pp.35-6.

SILVERMAN, ROBERT E., and ALTER, MILLICENT, "Response mode, pacing and motivational effects in teaching machines", Port Washington NY, Tech.Rep. 507-03 (1961), pp.69.

SILVERN, LEONARD C., "Methods and devices for putting an in-service training program in effect", Hmghes Aircraft Co., (1960).

SKELLEY, J. F. 'Use of the Vu-graph in Remedial Reading", Audio-Visual Guide, 18, (1952), pp.25.

SKINNER, BURRHUS FREDERIC and HOLLAND JAMES G., "The Use of Teaching Machines in College Instruction", Report Parts 2-4 to Fund for Advancement of Ed. (1958), pp.159-172.

SKINNER, B. F. "The Experimental Analysis of Behavior", *American Scientist*, 45, (1957), pp.343-71.

SKINNER, B. F. "Report No. 2 on the Development of Methods of Preparing Materials for Teaching Machines", Unpublished Report to Human Resources Research Office, (1957).

SLACK, C. W. and TARSHIS J., Reformatories - Programmed learning passes a tough test., *il. Am. Sch. & Univ.* 36,(1963), pp.34+.

SLUCKI, HENRY, "Equipment Note: Inexpensive single-direction Winding Key Adapted to Teaching Machines", *The Journal of Programmed Instruction*", 2, (1963), pp.55-56.

SMART, A. J. H. "Automated instruction", *Armidale Teach. Coll.Bull.*, 10, (1963), pp.12-16.

SMITH, D. E. P.; WOOD, R. L. and CARRIGAN P. M. *The SA-S Senior and Junior Scales*, Chicago, Psychotechnics, Inc. (in press).

SMITH, EDGAR, A., and QUACKENBUSH JACK, "Devereux teaching aids employed in presenting elementary mathematics in a special education setting", *Psychological Reports*, 7, (1960), pp.333-336.

SMITH, H.F. Anecdotes, facetiae, satire etc. - "Case of Johnnie Lernslo", *Ed.*, 83, (1963), pp.433-5.

SMITH, H. P. and TATE, T. R. "Improvements in Reading Rate and Comprehension of Subjects Training with the Tachistoscope", *Journal of Educational Psychology*, 44, (1953), pp.176-84.

SMITH, K. R. and VAN ORMER E. G. *Learning Theories and Instructional Film Research*, Sepcial Devices Centre, *Office of Naval Research (1949)*, *Technical Report SDC 269-7-6*.

SMITH, LEANDER W., "An open letter on teaching machines and programme learning", Read at Boston Uni. Conference on Secondary Education (1961).

SMITH, M. D. "Workshop in programmed instruction stresses application of theory to practice", *Teach.Col. J.*, 34, (1962),pp.28.

SMITH, ROBERT G. Jr. "Teaching Machines and Programmed Instruction Some Factors to consider in implementation", Research Memorandum, US Army Air Defense Human Research Unit, Fort Bliss, (1961).

SMITH ; R.L. WOOD and CARRIGAN P. M. *The Sa-S Senior and Junior Scales*, Bureau of Psychological Service, Uni. of Michigan (1959).

SMITH N. H. "Teaching of elementary statistics by the conventional classroom method versus the method of programmed instruction", *J.Ed. Res.*, 55, (1962), pp.417-20.

SMITH, WENDELL, I. and MOORE, J. WILLIAM, *Programmed Learning: Theory and Research*, D. Van NostrandCo.In. NY, (1962).

SMITH, WENDELL I. and MOORE J. WILLIAM, "Size of step and achievement in programmed Spelling", Bucknell Uni. Mimeo (1961).

SNIDER, ROBERT C., "Teaching Machines", *Nations Schools*, 67, (1961), pp.70-3.

SNYDER, A. "The Flashreader in the Reading Laboratory", English Journal, 41, (1952), pp.269.

SNYGG, D. "Address to Div. of Audio-visual Instruction at Natl. Educ. Ass. Convention,1960", Audio-Visual Instruction,6,(1961),pp.276

SOHN, DAVID A., "PI: A View from the classroom", Programs,Teachers and Machines, (1964), pp.180-184.

SOLES, STANLEY, "Educational Quackery external to our schools: What is a professional response", Phi Delta Kappan, 44, (1963), pp.273-280.

SORENSEN, PHILIP H. and KINCAID, HARRY V., "What's ahead in the PI market?", API, (1962), pp.145-160.

SPENCE, K. W. "Theoretical Interpretations of Learning", Handbook of Experimental Psychology, (1951).

SPENCE, K. W. "The relation of learning theory to the technology of education", Harvard Educational Review, 29, (1959), pp.84-95.

STATION, T. F. and MAIZE R. C. "A Voluntary Reading-Improvement Program for Air Force Officers", School and Society, 76, (1952),pp.42-44.

STECCHINI, LIVIO, "Prospects in retrospect: On educational Technology", The American Behavioral Scientist, 6, (1962), 3, (Programs, Teachers and Machines (1964), pp.25-33).

STEPHENS, A. L. "Certain Special Factors Involved in the Law of Effect", Abstracts of Doctoral Dissertations, No.64, (1953), pp.89-93.

STEVENS, J. M. Educational Psychology, Revised Edition, Henry Holt & Co. (1956).

STEVENS, KIMBLE, "New miracle way to learn anything fast", Pageant, (196 ), pp.140-145.

STEVENS, S. S. (ed.), Handbook of Experimental Psychology, John Wiley & Sons (1951).

STEVENS, TRAXEL, "The look of things to come", The Texas Outlook (1961).

STODDARD, A. J. Schools for Tomorrow, The Fund for the Advancement of Education (1957).

STOLUROW, LAWRENCE, M. "Implications of Current Research and Future Trends", Journal Ed. Res., 55, (1962), pp.519-527.

STOLUROW, LAWRENCE M., "Problems in evaluating automated instruction", Teacher College Record , 63, (1961), pp.66-70.

STOLUROW, L. M. "Programmed instruction for the mentally regarded", Bibliog, R.Ed. Res., 33, (1963), pp.126-36.

STOLUROW, LAWRENCE M. "Prompting vs. Confirmation Sequences and Overlearning in the Automated Teaching of Sight Vocabulary", American Psychological Asscn. Annual Convention, (1961), Tech.Rep.Cont. SAE 8370, (1962), De Cecco (1964), pp.187-197.

STOLUROW, LAWRENCE M., and LIPPERT, HENRY, "Prompting, Confirmation and Overlearning in the Automated Teaching of a Sight Vocabulary", De Cecco, (1964), pp.187-197.

STONE, C. WALTER, "The crisis in education - a mandate for librarians", ALA Bulletin, (1961).

STONE, G. R. The Training Function of Examinations: Retest Performance as a Function of the Amount and Kind of Critique Information, Lackland Air Force Base, Texas: Air Force Personnel and Training Research Centre, (19 55), Research Report AFPTRC-TN-55-8.

STOTT, D. H. "Genesis of programmed reading", Times Ed. Sup.., 2492, (1963), pp.354.

STOTT, D. H. "Programmed learning for the retarded", Education, 121, (1963), pp.1081-1083.

SUELTZ, B. A. "Counting Devices and Their Uses", Arithmetic Teacher 1, (1954), pp.25-30.

SYMONDS, P. and CHASE D. H. "Practice vs. Motivation", Journal of Educational Psychology, 20, (1929), pp.19-35.

TABER, JULIAN I. and GLASER, ROBERT "An Exploratory Evaluation of a Discriminative Transfer Learning Using Literal Prompts", Journal of Educational Research, 55, (1962), pp.508-512.

TABER, JULIAN I.; GLASER ROBERT and SCHAEFER HALMUTH H., "Learning and PI", Addison-Wesley, Reading Ma., (1965), pp. x + 182.

TANZMAN J., "Audio-Visual Program: What you need beyond equipment", Sch. Mgt., 7, (1963), pp.14-18+.

TARIS, C. M. "Automatic answer only set", Bell Laboratories Record, 34, (1956), pp.165-68.

TAVES, M. J. and GROSS N. "A Critique of Rural Sociology 1950", Rural Sociology, 17, (1952), pp.109-18.

TAYLOR, E. A. Controlled Reading, Chicago, Uni. of Chicago Press (1937).

TER KEURST, A. J. Elementary Schools - "Programmed instruction and concept building", Sch. & Com., 50, (1964), pp.15+.

THELEN, H. A. "Programmed Materials today: Critique & Proposal", El.Sch. J., 63,(1963), pp.189-196.

THOMPSON, W. C. "A Book Versus Machine Experiment in Adult Reading Improvement", College English, 15, (1954), pp.471-73.

THOMSON, PAUL F. "Programmed Learning Integration", Technical Education and Industrial Training, 6, (1963), 3.

THORNDIKE, E. L. Fundamentals of Learning, Bureau of Publications, Teachers College, Columbia Uni. (1932).

TINKER, M. A. and RUSSELL, W. A. Introduction to Methods in Experimental Psychology, Appleton-Century-Crofts, (1958).

TOLMAN, E. C. *Purpositive Behavior in Animals and Men*, Uni. of California Press (1951), Originally Published 1932.

TORREYSON, H. C. "Equation Balances", *School Science and Mathematics*, 55, (1955), pp.104-108

TRACEY, W. R. "Programming: Evaluating achievements", *Clearning House*, 38, (1963), pp.143-8.

TRAXLER, A. E. "Value of Controlled Reading: Summary of Opinion and Research", *Journal of Experimental Education*, 11, (1943),pp.280-92.

TROW, WILLIAM CLARK, "Teacher and Technology", New Designs for Learning Appleton-Century-Crofts, (1963), pp. x + 198.

TUCKER, JOSEPH, A., "The administrator and new instructional media", *PIP*, (1963).

TUCKER, DR. JOSEPH A. Jr., "Intrinsic programming:" A Simulation technique presented before the San Francisco State Coll. Institute: Training by Automation in Industry, (1960).

TWYFORD L. C. "Profile techniques for program analysis", *AV Communication Review*, 2, (1954), pp.243-261.

UNDERWOOD, B. J. "Verbal Learning in the Educative Process", *Harvard Educational Review*, 29, (1959), pp.107-17.

UNZICKER, C. E. *An Experimental Study of the Effect of the Use of the Typewriter on Beginning Reading,* Teachers College Contributions to Education No. 610, Teachers College, Columbia Uni. (1934).

VAN ATTA L., and MC COLLOUGH C., "The Use of miniature programs to supplement conventional teaching technique, Presented at Meeting APA, Chicago, (1960).

VARTY, J. W. "Programmed instruction for prospective teachers", Bibliog, *f. Ed. Forum,* 28, (1964), pp.227-35.

VERPLANCK, W. S., "A Glossary of Some Terms Used in the Objective Science of Behavior", *Supplement to the Psychological Reivew*, 64, (1957).

VINCENT, W. S.; ASH, P; and GREENHILL L.P. *Relationship of Length and Fact Frequency to Effectiveness of Instructional Motion Pictures*, Special Devices Centre, Office of Naval Research, (1949), Technical Report SDC 269-7-7.

VOSS, H. A. and RHOADS C, S., *Application of Electro-Physiological Techniques to Human Performancd: The Reading Assessor - The Alertness Indicator*,Special Devices Centre, Office of Naval Research (1950), Technical Report SDC-58-2-11

VOTAW, D. F. and DANFORTH L. "The Effect of Method of Response upon the Validity of Multiple-Choice Tests", *Journal of Educational Psychology*, 30, (1939), pp.624-27.

WAGNER, R. W. "The Teaching Film of Tomorrow", *Audio-Visual Communication Review*, 2, (1954), pp.216-19.

WALLER, THEODORE, "Future of programmed instruction", *Ed.*, 83, (1963), pp.395-9.

WARREN, A. B. and BROWN R. H. "Conditioned Operant Response Phenomena in Children", *Journal of General Psychology*, 28, (1943), pp.181-207.

WARREN, N.; ATKINS D. W.; FORD J.S., and WOLBERS H. L. "Development of a Training Program for Teaching Basic Principles of Trouble Shooting", Technical Memorandum, Armament Systems Personnel Research Lab., AFPTRC, Lowry Air Force Base, Colo., (1955),(ASPRL-TM-55-19).

WASHBURN, J. N., "The Use of Questions in Social Science Material", *Journal of Educational Psychology*, 20, (1929), pp.321-59.

WECHKIN, S. "Word learning in an automated teaching situation as a function of display condition", Bibliog, *J.Ed.Psychol*, 53, (1962), pp.165-9.

WEDEEN, S. U. "Mechanical Versus Non-Mechanical Reading Techniques for College Freshman", *School and Society*, 79, (1954), pp.121-23.

WENDT, P. R. "Magnetic Sound Film has many Classroom Uses", *The Nations Schools*, 51, (1953), pp.88-90.

WENDT, P. R., and RUST, G. C., "Programmed instruction for transfer to the real life situation", *Phi Delta Kappan*, 44, (1963), pp.23-7.

WENDT, P. R. and RUST, G. C., Colleges and Universities - "Pictorial and performance frames in branching programmed instruction", *J.Ed.Res.*, 55, (1962), 430-2.

WEST, MICHAEL, "Learning English as Behavior", *English Lang.Teaching*, 15, (1960), pp.3-11.

WEST, MICHAEL PHILIP, "Construction of Reading Material for Teaching a Foreign Language", (1927).

WESTOVER, F. L. *Controlled Eye Movements Versus Practice Exercises in Reading*, Teachers College Contributions to Education, No. 917, New York, Teachers College, Columbia Uni. (1946).

WHITE, R. I. "Programmed Learning", *il. Minn. J. Ed.*, 44, (1963), pp.7-8.

WIDLAKE, P., "English sentence construction: the effects of mode of response on learning", *Educational Review*, 16, (1964), pp.120-129.

WIEDERANDERS R. A. "Eighth Okoboji: an unstructured conference on programmed learning", *il.Av. Instr.*, 8, (1963), pp.90-3.

WIENER, N., *Cybernetics: or Control and Communication in the animal and the machine*, New York: John Wiley & Sons (1948).

WILLIAMS, CLARENCE, "How to individualise instruction through automated teaching", Presented before the Genesee Valley School, Study Council, Rochester, NY, (1960).

WILLIAMS, CLARENCE M., "Information disseminator or guide of learning? - training the teacher for the classroom of the 70's" *PIP*, (1963).

WILLIAMS, J. D., "Aspects of PI some notions and arguments", *Ed. Res.*, 5, (1963), pp.163-178.

WILLIAMS, J. P. Evaluation - "Comparison of several response modes in a review program", Biblio, *J.Ed. Psychol.*, 54, (1963), pp.253-60.

WILLIAMS, JOANNA P., "Effectiveness of constructed response and multiple-choice programming modes as a function of test mode", *Journal of Educational Psychology*, 56, (1965), pp.111-117.

WILLIAMS, M., Programs Printed - 500 Christmas program .....", *il. Arts & Activities*, ???????(1963).

WILSON J. A. R., and HEYWOOD J., "Linear programmed materials in subject A instruction", *Calif.J.Ed.Res.*, 15, (1964), pp.6-11.

WITCHER, C. M. "The Teaching of mathematics to the Blind", *Mathematics Teacher*, 48, (1955), pp.314-21.

WITTICH, W. A. and SCHULLER, C. F. *Audio-Visual Materials, Their Nature and Use*, NY, Harper & Bros., (1953).

WITTY, P. A. "Problems in the Improvement and Measurement of Growth in Reading", *School and Society*, 78, (1953), pp.69-73.

WITTY, P. A. "Evaluation of Methods and Devices to Improve Reading Rate and Comprehension", *Elementary English*, 31, (1954),pp.260-67.

WITTY, P. A. and FITZWATER J. P. "An Experiment with Films, Film-Readers, and the Magnetic Sound Track Projector", *Elementary English*, 30, (1953), pp.232-41.

WITTY, P. A. and KOPEL D., *Reading and the Educative Process*, Boston, Ginn & Co., (1939).

WITTY, P. A.; STOLARZ, T; and COOPER W., "Some Results of a Remedial Reading Program for College Students", *School and Society*, 76, (1952), pp.376-80.

WITZEMAN, B. E., "An Experimental Study Using the Ophthalm-o-graph and Metron-o-scope in the Diagnosis and Treatment of Reading Defects", *Journal of Psychology*, 11, (1941), pp.307-34.

WOHLWILL, J. F. "Teaching machine: Psychology's new hobby-horse", Bibliog. *Teach Col.Rec.*, 64, (1962), pp.139-46, same cond. *Ed.Digest*, 28, (1963), pp.5-8.

WOLF, MELVIN H., "A Study of the Comparative Effectiveness of the (1) Programmed Instructional and (2) Conventional Classroom Methods of Teaching English Grammar and Mechanics", University of Massachusetts, Amherst, (with the cooperation of Martha R. Wright).

WOLFLE, D. "Training", *Handbook of Experimental Psychology*, (1951). (ed. by S.S.Stevens).

WOODWORTH R. S., "A Contribution to the Question of 'Quick Learning, Quick Forgetting'", *Psychological Bulletin*, 11, (1914),pp.58-59.

WOODWORTH, R. S. *Experimental Psychology*, NY, Henry Holt & Co.(1938).

WOODWORTH R. S. and SCHLOSBERG, H. *Experimental Psychology*, Revised Edition, NY, Henry Holt & Co. (1954).

WOOLMAN, MYRON, "Programming for Conceptual Understanding", Rep. to Communication Scoial Science Research Dept.Bell Telephone Lab., Inst. of Ed. Res., Washington.

WOOSTER, G. F. "An Experimental Study of the Reading-Rate Controller", *Journal of Educational Psychology*, 45, (1954), pp.421-26.

WYCKOFF, L. B. "The Role of Observing Responses in Discrimination Learning", *Psychological Review*, 59, (1952), pp.431-42.

ZABORSKA, M. Sample Programs - "Biggest reptiles: Alligators and Crocodiles", *Grade Teach,* 80, (1963), pp.42-3+.

ZISKIND, M. "Programmed Instruction for curriculum enrichment", *Nat.Cath.Ed.Assn.Bul*., 60, (1963), pp.100-2.

~~YALE MOTION PICTURE RESEARCH PROJECT. "Do Motivation and Participation Questions Increase Learning?", *Educational Screen*, 26, (1947), pp.256ff.~~

## APPLIED STUDIES

"First Reports on Roanoke Math Materials", *Audiovisual Instruction*, 6, (1961), pp.150-51.

"IBM 709 Tutors MIT students", *AID*, (1961), pp.67.

"Implementation Studies", *Programmed Instruction*, 1, (1962), p.3.

"Basic Systems Inc. Staff Memorandum:Present & Emerging Needs for Job Training", API, (1962), pp.161-188.

"Report of Accelerated Training", (Project No. FM-T-24), General Telephone Co. of California, Santa Monica, (1961).

TEMAC: *Programmed Learning Materials*, (Report No. 2), Wilmette, Ill., Encyclopaedia Britannica Films (1961).

ALEXANDER HOWARD and SMITH R., "Student self-instruction project: Elementary Statistics", Earlham College, Richmond, Indiana.

ALLEN, LAYMAN E., "WFF 'N Proff: The Game of Modern Logic", ALL (Accelerated Learning of Logic) Project, Yale Law School, New Haven,

ALLEN, LAYMAN E., "Progress report of the All Project", Yale Uni., (1961).

ALLEN, LAYMAN E.; BROOKS, ROBIN; DICKOFF JAMES W., and JAMES PATRICIA A., "The ALL Project (Accelerated Learning of Logic), *American Mathematical Monthly*, 68, (1961), pp.497-500.

ALLEN, LAYMAN E., and JAMES PATRICIA A., "Toward a Systematic Procedure for developing Skinner Learning Programs", Yale Law School, New Haven (1960).

ALLEN, W. H. "Research on Film Use: Student Participation", *Audio Visual Communication Review*, 5, (1957), pp.423-450.

ALLISON, FAY S., "A Comparison of Methods for Teaching Certain Counselling Materials", Uni. of Utah, MA Thesis, (1960).

BANGHART, FRANK W., "An Experiment with Teaching Machines and Programmed Textbooks", Uni. of Virginia.

BANGHART F. W. and others, "Experimental study of programmed versus traditional elementary school mathematics", *il.Arith.Teach.*, 10, (1963), pp.199-204.

BARCUS, DELBERT; HAYMAN, JOHN L., and JOHNSON, JAMES T., "Programming Instruction in Elementary Spanish", *Phi Delta Kappan*, 44, (1963), pp.269-272.

BARLOW, JOHN A., "Earlham College Student Self-Instructional Project", (First Quarterly Report), Report submitted to the U.S.Office of Education by Earlham College, Richmond, Ind., (1959).

BARLOW, JOHN A., "The Earlham College Self-instructional Project", *Audio-Visual Communication Review*, 8, (1960), pp.207-209.

BARRUTIA, RICHARD, "A Suggested automated Branch program for Foreign Languages", *Hispania*, 47, (1964), pp.342-350.

BENSON, EUGENE, and KOPSTEIN FELIX, "Machine Teaching for Basic Electronics at Keesler Air Force Base: An Experiment and Results"., NEA Davi Convention Miami, Florida, (1961).

BISHOP C. K. and REGAN J. J. "PI in the Armed Forces, An Overview", *API*, (1962), pp.59-69.

BLYTH, JOHN S., "An Educational Experiment", *College Hill*, 4, (1960), pp.4.

BLYTH, J. W. "The Hamilton College Experiment in Programmed Learning", The Fund for the Advancement of Education of the Ford Foundation, (1961).

BRIGGS, LESLIE J., and BESNARD G. G., "The Benefits from increased practice in training electronic system mechanism", Tech. Memorandum, Armament Systems Personnel Research Lab. AFPTRC, (1955).

BRIGGS. L. J. and BESNARD G. G. "Experimental Procedures for Increasing Reinforced Practice in Training Air Force Mechanics for an Electronic System", *Symposium on Air Force Human Engineering Personnel and Training Research*, (eds.) G.Finch and F. Cameron, (1956).

BRIGGS, LESLIE J., and DU VALL W. E., "Design of two fire control system maintenance training devices", Lackland Air Force Base, Texas, Air Force Personnel and Training Research Centre (1957), Technical Report AFPTRC-TR-57-7 ASTIA 134242.

BROWN, O. ROBERT, "A Comparison of test scores of students using PI Materials with those of students not using PI Materials", Urbana, Uni of Illinois, (1962).

BRYAN, GLENN L. and RIGNEY, JOSEPH W., "Current trends in automated tutoring and their implications for naval technical training", Dept. Psychology, Uni. of S.California, Tech. Rep. 29, (1959).

BRYAN, G. L. and RIGNEY, J. W. *An Evaluation of a Method for Shipboard Training in Operations Knowledge* (Technical Report 18). Uni. of Southern California (1956). pp.594-5.

BRYAN G., and RIGNEY J., and C VAN HORN, *An Evaluation of Three Types of Information for Supplementing Knowledge of Results in a Training Technique*, Technical Report 19, Uni. of S.Calfornia, (1957), pp.23.

BRYAN, GLENN L. and SCHUSTER DONALD H., "The effectiveness of guidance and explanations in troubleshooting training", Tech. Rep. 28, Electronics Personnel Research Group, Uni, of S. California (1959).

BRYAN G., and D.H. SCHUSTER, *An Experimental Comparison of Trouble-Shooting Training Techniques*, Technical Report 30, Uni. of S.California, (1959), pp.596-7.

BUITENKAND, NATHAN, "Methods of instruction in component location for trouble shooting in complicated equipment and means for testing accurany of answers", U.A.Patent 2,764,821, (1953), patented (1956).

BUSHNELL,DAVID S., "Technological Change and the Journeyman Electrician", An Experimental Study in continuing education, Stanford Research Institute, Menlo Park, Calif. (1963).

BUZBY, J. J. and MANN L., "TMI Self-tutoring program in spelling compared with teacher and flash card taught programs", *J.Ed.Res.*, 55, (1962), pp.585-6.

CALVIN, ALLEN, "A Demonstration Class Using Teaching Machines for Ninth Grade Algebra", Unpublished paper Hollins College, Va.,(1960).

CALVIN, ALLEN D., "Preliminary Report of the Roanoke Programmed Textbook Project", Britannica centre for studies in learning and motivation, Hollins College, (1961).

CALVIN, ALLEN D., "A Report on retention of programmed material", Hollins College.

CAMPBELL E., "Utilizing the teaching machine for cerebral palsy children", Study presented at Allerton Park Conference on automation in Special Education, (1960).

CAMPBELL, VINCENT, N., "Adjusting self-instruction programs to individual differences: Studies of cueing, responding and bypassing", American Inst. for Research, (1961).

CANTOR, J. H. and BROWN J. S. *An Evaluation of the Trainer-Tester and Punchboard Tutor as Electronics Troubleshooting Training Aids*, (Tech. Report NAVTRADEVCEN-1257-2-1), Port Washington, U.S. Naval Training Devices Centre (1956).

CARROLL, JOHN B., "Programmed Self-Instruction in Mandarin Chinese: Observations of Student Progress with an Automated Audio-visual Instructional Device", Language Testing Fund, Wellesley, Mass., (1963), pp.97.

CHALMERS, E. J. Jr.; MORRISON E. J.; BRIGGS, I. J. and PENS E. H. "Evaluation of a Method for teaching trouble-shooting techniques", Tech.Memorandum,Maintenance Lab. AFPTRC, Lowry Air Force Base, Colo., (1957), ML-TM-57-34.

CHAVY, PAUL, "Traduction automatique et enseignement des Langues Etrangeres", *The French Review,* 36, (1963), pp.383-387.

CLARK, WILLIAM H. and CLARK, MARGARET G., "Achievement in Elementary German under Programmed and Conventional Instruction: A Preliminary Study", *MLJ*, 50, (1966), pp.97-100.

CROWDER, N. A. *The Arithmetic of Computers* (Scrambled Book), Doubleday, (1960), pp.609.

CROWDER, N. A. and ZACHERT, VIRGINIA, "Use of the Auto-Tutor at Keesler AFB to Train in Fundamentals of Electronics", (Memorandum Report No. 1), Division of U.S. Industries, Goleta, Calif.

CURRY, T., "Teaching English by programmed instruction: English 2600", *Nat.Cath.Ed.Assn. Bul.*, 60, (1963), pp.322-6.

DAMRIN, D. E., and SAUPE, J. L. "Proficiency of Q-24 Radar Machines: 4", An Analysis of checking responses in troubleshooting on Tab Test Problems, Lackland Air Force Base, Texas, AFPTRC-TR-54-53 (1954).

DIEDERICH, P. B., "Self-Correcting Homework in English", *Proceedings of the Educational Testing Service Invitational Conference, (1959).*

DOERHOFF, R., "Programmed material in a small high school", *Sch. & Com.,* 49, (1963), pp.17.

DOWELL, E. C. "An Evaluation ofTrainer-Testers", Headquarters, Tech. Training Air Force, Keesler Air Force Base, (1955).

EDDY, FREDERICK D., "1959 Revisited", *Audiovisual Instruction,* 7, (1962), pp.602-623.

EDGERTON, A. K. "Programmed course in spelling", Bibliog, *El. Sch.*
and R.W. Twombly, *J.,* 62, (1962), pp.380-6.

EIGEN, LEWIS D., and KOMOSKI, P. KENNETH, "Research Summary No. 1", *Articles on Programmed Instruction,* (1960), pp. 10 + xix.

ENGELMANN, M. D. "Construction and evaluation of programmed materials in biology classroom use", *Am.Biol Teach.,* 25, (1963), pp.212-14.

ESTARELLAS JUAN, "The Challenge of Programmed Instruction to the Foreign Language Teacher", *The Florida FL Reporter,* 4, (1965-1966), pp.19 and 25.

FATTU, NICHOLAS A., "A Catalogue of troubleshooting tests", Research Report No. 1, prepared for the Personnel and Training Branch,Psychological Sciences Div., Office of Naval Research , Uni. of Bloomington, (1956), pp.130.

FATTU, NICHOLAS A. "Evaluation of automated instruction", Bibliog., *Ed.,* 83, (1963), pp.406-11.

FELDHUSEN J. A. "Reactions of College Students to a Self-Instructional Teaching Device and Programmed Instruction", *AID,* 1, (1961), pp.37-38.

FESSANT, J. M. "Application of programmed learning for deaf children to industrial arts", *il.Am. Ann.Deal,* 108, (1963),pp.241-4.

FILLMER, H. T. Programmed Textbooks - "Programmed Instruction in elementary English", Bibliog., *El. Engl.,* 40, (1963),pp.833-7.

FILLMER, H. T. "Programmed Instruction in the Elementary School", *El.Sch.J.,* 63, (1963), pp.197-200.

FINSTAD, ALICE, "First reports on Roanoke Math.Materials", *AV Instruction,* 6, (1961), pp.150-115.

FORBES, J. E. "New mathematics and programmed learning: Programming takes many talents", *Av. Instr.,* 7, (1962),pp.156-7.

FORD, R. G., "Evaluating a chemistry program", J.Chem.Ed., 40, (1963), pp.16-17.

FRY, EDWARD B., "The Use of Programmed Learning in the teaching of reading", Phi Delta Kappan, 44, (1963).

GAGNE, ROBERT M., "AFPTRC Maintenance Lab. Research and Development Program", Staff Memorandum, Maintenance Lab. AFPTRC Lowry Air Force Base, Colo., (1957).

GELLER, M. S. "Pupils' attitudes toward programmed learning ", Bibliog. f. Sci.Teach, 30, (1963), pp.41-2.

GODCHARLES, CHARLES, "Research by Fr.Germ, Math, Philos & Psych Depts. to Program their Elementary Year courses for Machine Teaching and to Study the Use of the Method over next two years by 300 students enrolled in these courses",

GOLDBERG, A. L. "Programmed Spelling: A Case Study", Av.Instr., 8, (1963), pp.94-6.

GOLDBERG S.; KEISLER E. R., and MC NEIL J. D., "Teaching scientific theory to first grade pupils by auto-instructional device", Harvard Ed. R., 31, (1961), pp.451-3.

GRIFFITH, JANET D., "Clearinghouse Report: Results of the Survey of the Use of Programmed Foreign Language Instruction in American Universities and Colleges", Centre for Applied Linguistics, Washington, (1965).

HAIN, K. A Case Study in Programmed Instruction, Basic Systems, (1961).

HAMLIN, FRANK and MORAUD, MARCEL, "Project to apply B.F. Skinner's principles of learning to the learning of French", Program being tested and revised at Hamilton College, Clinton NY and Barrington HS in Rhode Island (1961).

HANZELI VICTOR E., "Programmed Learning in French: Work in Progress", The French Review, 35, (1962), pp.587-589.

HATCH, RICHARD S., "Doubleday's Tutor Texts", Read at the APA Meeting (1961).

HATCH, RICHARD S., "An evaluation of the effectiveness of a self-tutoring approach applied to pilot training", Wright Air Development Centre, (1959), WADC Tech. Report TR-59-320.

HERBERT, JOHN and FOSHAY ARTHUR W., "PI in the Manhasset Junior High School", Four Case Studies of PI, pp.17-27.

HIVELY, W. "An Exploratory Investigation of an Apparatus for Studying and Teaching Visual Discrimination, Using Preschool Children", Teaching Machines and Programmed Learning, eds., A.A.Lumsdaine and R. Glaser, (1960), pp.247-56.

HOERGER, J. W. "Minnetonka: Satire", H.Points, 43, (1961),pp.25-30.

HOLLAND, JAMES G., "Programming Verbal Knowledge", Harvard Psychological Laboratories, (1960).

HOLLAND, JAMES G., "A Teaching Machine Program in Psychology", Galanter, (1959), pp.69-82.

HOLLAND, J. E. "A Teaching-Machine Program in Psychology", Automatic Teaching: The State of the Art, (ed.), E.Galanter, (1959),pp.69-82.

HOLLAND J. G. "Teaching Psychology by a Teaching Machine Program", Paper Read at the APA Annual Convention (1959).

HOLLAND J. G., and SKINNER B. F. 'The Analysis of Behavior, McGraw Hill, (1961).

HOLT, H. O. Exploratory Study of the Use of a Self-Instructional Program in Basic Electricity, Bell Laboratories (1961).

HOLT, H. O. and HAMMOCK J., "Books as Teaching Machines: Some Data", Paper read at Annual Convention of Midwestern Psychological Asscn., (1961).

HOLT, HOWARD O., and HAMMOCK J., "Books as teaching Machines: Some Data", (Margulies S.S. and Eigen Lewis D.), Applied Programmed Instruction, (1962), pp.50-56.

HOMME. LLOYD E., "TMI-Grolier programmed texts", Read at APA Meeting (1961).

HOSMER, CLARK L., and NOLAN, JAMES A., "Time saved by a tryout of Automatic Tutoring", API, (1962), pp.70-72.

HOSMER, C. L. and NOLAN J. A. "Time Saved by a Tryout of Automatic Tutor-ing", Automated Teaching Bulletin 1, (1960), pp.17-18.

HOUNTRAS P. T., and BELCASTRO F. P. Construction - "Comparison of four techniques of programming algebra", Bibliog., Sci.Ed., 47, (1963), pp.388-93.

HOVLAND, C. I.; A.A. LUMSDAINE, and F.D. SHEFFIELD, Experiments on Mass Communication, Princeton Uni.Press (1949).

HUGHES J., "The effectiveness of PI: Experimental Findings", API, (1962), pp.44-49.

HUGHES, J. L. "The effectiveness of Programmed Instruction: Experimental Findings for 707.0 Training", Articles on Programmed Instruction (1961), 12 pages.

HUGHES, J. L. "Programmed Instruction for Schools and Industry", SRA, Chicago (1962), pp. xv + 299.

HUGHES, J. L. Programmed Instruction: A Follow-up Study of 7070 Training, Applied Personnel Research IBM, (1961).

HUGHES, JOHN L., and MC NAMARA W., "A Comparative Study of Programmed and Conventional Instruction in Industry", Journal of Applied Psychology, 45, (1961), pp.225-231.

HUNT, H. A. K. and KEEVES, J. P. "An Exploratory Study of the value of PI in dependent clauses in Latin at the Intermediate Certificate Level (4 year secondary school), in Vic", A.C.E.R., (1965).

HUNTLEY, JOHN F., "A Program for programming English Composition", Journal of General Education, 17, (1965), pp.135-148.

JACOBS, P. I. "Some Relationships between Testing and Auto-Instructional Programming", AV Communication Review, 10, (1962), p.317.

JEROLD, W. W. Sample Programs - "Programmed learning in electronics", diags. Ind.Arts & Voc.Ed., 52, (1963), pp.22-3.

KALIN, R. "Use of programmed instruction in teaching an advanced mathematical topic", Arith.Teach, 9, (1962), pp.160-2.

KEISLAR, EVAN R., "A Comparison of two response modes in an auto-instructional program with Children in the primary grades", Read at APA Meeting (1960).

KEISLAR E. R. "The Development of Understanding in Arithmetic by a teaching machine", Journal of Educational Psychology , 50, (1959), pp.247-253.

KEISLAR E. R. "The Development of Understanding in Arithmetic by a Teaching Machine", Journal of Educational Psychology, 50, (1960), pp.247-53.

KEISLAR EVAN R., "Reinforcement procedures in teaching algebraic concepts to first Graders", Read at the APA Meeting(1961).

KEISLAR E. R., and MC NEIL, J. D. "A Comparison of two response modes in an auto instructional program with children in the primary grades", Journal of Educational Psychology, 53, (1962), pp.127-31.

KEISLAR E. R. and MC NEIL J. D. Teaching Scientific Theory to First-Grade Pupils by an Auto-Instructional Device, Harv.Ed.Rev., 31, (1961), pp.73-83.

KLAUS, D. J. and GLASER ROBERT, "Studies of navy guided missile teams", American Institute for Research, Pittsburgh, (1958).

KLAUS, D. J. and LUMSDAINE, A. A. An Experimental Field Test of the Value of Self-tutoring Materials in High School Physics, American Inst. for Research (1960).

KLAUS, D. J. and LUMSDAINE A. A. Supplement for Interim Report: Self-Instructional Supplements for a Televised Physics Course, American Inst. for Research, Pittsburgh, (1960).

KLASS, PHILIP, "Video-sonics cuts production defects", Aviation Week, (1960).

KNIGHT, STEPHEN, "Programming for the Retarded Reader", Programmed Instruction, 3, (1963), 3.

KOMOSKI, P. KENNETH, "Programming by Teachers for the School Curriculum", Articles on Programmed Instruction, (1961), pp.7.

KOMOSKI, P. KENNETH, "Quotations", Time, 77, (1961), 38.

KOMOSKI, P. KENNETH, "What are the schools doing?", National Education Asscn.Journal, 50, (1961), pp.28-30.

KORMONDY, E. J. "Earlham Experiment in self-instruction in General Zoology", Preliminary Analyses, Oberlin, Ohio (1960).

LEAHY, DANIEL and SIEGEL, BERTRAM, "The Science Teacher and PI", The Science Teacher, 29, (1962), pp.40-41+.

LEEDHAM, JOHN, "Programmed Learning: Revision in small groups", Educational Research, 7, (1965), pp.147-154.

LEONARD, P., "Programmed Instruction in Albegra", N.Y.State Ed., 50, (1963), pp.13+.

LERMONTOFF, ALEXANDER, "Programmed Instruction in Beginning French", The Centre for Programmed Instruction, (1961).

LITTLE,J. K. "Results of Use of Machines for Testing and for Drill upon Learning in Educational Psychology", Journal of Experimental Education, 3, (1934), pp.45-49.

LUMSDAINE ARTHUR A., "Some Short Illustrative Sequences from self-instructional Programs", (1960)., Some 35 sequences from various self-instructional programs.

LYSAUGHT, JEROME, P. "Industrial Training through Programmed Learning", Personnel Journal, 40, (1961), pp.165-169.

LYSAUGHT, JEROME P., "Programmed Learning and Teaching Machines in Industrial Training", 1 and 2, Journal of American Society of Training Directors, (1961).

LYSAUGHT, J. P. and WILLIAMS, C. M. "Programmed Learning at all levels: Genesee Valley programming society unites nearly 300 in experimental work leading to research", il.N.Y.State Ed., 49, (1962), pp.18-20.

MC NAMARA W. J. and HUGHES, JOHN L. "IBM's experience in Developing Programmed Instruction", (Ed.)Jerome P.Lysaught, Programmed Learning Evolving Principles and Industrial Applications, Foundation for Research on Human Behavior, (1961).

MC NEIL, JOHN D., "Programmed Instruction as a Research Tool in Reading: An Annotated Case", Journal of Programmed Instruction, 1, (1962),pp.37-42.

MARGULIES, STUART S., Programmed Teaching - Another look at programmed instruction in business education", Am.Bsns.Ed., 18, (1962),pp.224-6.

MARGULIES, STUART S., and EIGEN, LEWIS D., "Applied Programmed Instruction", Wiley, NY, (1962), pp. ix + 387.

MEYER, SUSAN R., "A Program in elementary arithmetic present and future, Galanter, 83-84.

MARKLE, SUSAN R. MEYER, "Report on the Initial Test of a Junior High School Vocabulary Program", Teaching Machines and Programmed Learning (eds.) A.A.Lumsdaine and R. Glaser, (1960), pp.229-46.

MARKLE, SUSAN MEYER, "Words: A Programmed Course in Vocabulary Development", SRA Chicago (1962), pp.102.

MARQUARDT, WILLIAM F., "Programmed Instruction: General Principles for the Teaching of English as a second language", *Language Learning,* 14, (1964), pp.77-83.

MARTY, FERNAND, "Programming a Basic Foreign Language Course - Prospects for Self-Instruction", Audio-Visual Publications, Virginia, (1962).

MATHIEU, G., "How to Practice with Programmed Tapes in the Language Lab.", Distributed to all Foreign Lang. Students at Orange State Coll., (1963), p.1.

MATHIEU, GUSTAVE, "One Answer to Advanced Lab. Work", *MLJ*, 44, (1960), pp.123-6.

MAYER, EDGAR N., "The University of Michigan Project to Program Russian for Self-Instruction", *The Slavic and East European Journal*, (1962), pp.44-49.

MOORE, D. L. "Programmed Instruction and African Education", Dept. of Psych., Uni. of Sheffield.

MOORE, J. WILLIAM and SMITH, WENDELL I., "Knowledge of Results in Self-Teaching Spelling", *Psychological Reports*, 9, (1961), pp.717-726.

MORRIS, S.; "FLs: An Experimental Latin Program for Beginners", *Educational Review*, 16, (1964), pp.83-91.

MORRIS, S., "Programmed Learning in Latin 1 - Some Theoretical Problems", *Latin Teaching*, 31, (1964).

MORRIS, S., "Programmed Learning in Latin 2 - Writing and Using Programmes", *Latin Teaching*, 31, (1965), 6.

MORSE, R. J. and JONES, I. E., "Programmed Teaching in an Industrial Setting", General Telephone Co. of California, (1961).

MORTON F. RAND, "On the Advantages of Audio-Lingual Programming", Paper Read at AMA Conference on TM and Programmed Learning, Los Angeles, (1961).

MUELLER, THEODORE, "Programmed Instruction in Teacher Retraining (NDEA Institutes), *MLJ*, 50, (1966), pp.92-97.

NAUMANN, THEODOR, F., "A Laboratory Experience in Programmed Learning for students in Educational Psychology", *The Journal of Programmed Instruction*, 1., (1962), pp.9-19.

NEWMARK, GERALD, "Beginning Foreign Language Study Utilizing Dramatic Motion Pictures and Programmed Learning Materials", SDC Document FN-(L)-5873, (1961), pp.42.

NEWMARK, G., Programmed Teaching - "Foreign languages in elementary schools and implications for teacher education", Bibliog., *f.J.Teach.Ed.*, 14, (1963), pp.449-55.

NEWMARK, GERALD, "Research in PI in Spanish with 7th Grade Students", TM-895/103/00, System Dev.Corp. Santa Monica, (1964).

NOALL, M. S. "Automatic teaching of reading skills in high school", Bibliog, *J. Ed.*, 143, (1961), pp.1-71.

OAKES, W. F. "Use of Teaching Machines as a Study Aid in an Introductory Psychology course", *Psychological Reports*, 7, (1960), pp.297-303.

O'BRIEN, DON "Teaching Machine Experiment in Fire Training", *Fire Engineering*, 114, (1961), pp.27.

O'DONNELL, L. H. "Maintenance Engineering: A Study of Self-Instructional Techniques", Engineering Dept., E.I. duPont de Nemours & Co. Wilmington, Del., (1961).

O'NEAL, ROBERT, "My Aunt's Pen", *MLJ*, 47, (1963), pp.29-30.

PEINS, M. "Mechanical devices in the Classroom", *Elementary English*, 28, (1951), pp.138-140.

PENS, E. H. "Explanation of the functional block diagrams for two self-instructional fire control system maintenance trainers", Tech.Memorandum, Maintenance Lab., AFPTRC, Lowry AF Base, Colo., (1957), ML-TM-57-17.

POLITZER, ROBERT L., "Some Reflections on Pattern Practice", *MLJ*, 48, (1964), pp.24-28.

PORTER, D., "Some Effects of Year-Long Teaching-Machine Instruction", *Automatic Teaching: The State of the Art*, (ed.) E.Galanter, (1959), pp.85-90.

POWELL, V. P. "Programmed Instruction in High School Chemistry", *J.Chem.Ed.*, 40, (1963), pp.23-4.

PRICE, J. E. Special Schools and Classes - "Automated teaching programs with mentally retarded students", *J.Men.Deficiency*, 68, (1963), pp. 69-72.

REINER, WILLIAM B., "Programmed Learning: A Useful tool for the Science Educator", *The Science Teacher*, 29, (1962).

REQUEDAT, FRANCOIS, "Les Machines a Enseigner et les Programmes", *Le Francais dans le Monde*, (1964), pp.39-42.

RIEDESEL, C. A. Sample Programs - "In Slow Gear: On Teaching Arithmetic to slow learners", *Instr.*, 73, (1963), pp.28.

RIGNEY, JOSEPH W., and FRY, EDWARD, "A Survey and Analysis of Current Teaching Machine Programs and Programming", *Electronics Personnel Research Group Technical Report No. 31*, (1961), pp.145.

ROBERTS, J. D. "An Experiment in Programmed Instruction: Junior School Science", *Educational Review*, 15, (1963), pp.118.

ROCKLYN, E. H. and MOREN R. I., "Special machine-taught oral-aural Russian language course: A feasibility study", *Av.Comm.R.*, 10, (1962), pp.132-6.

ROE, A. and MOON H., "Analysis of Course Content for Individual Learning", Automated Teaching Bulletin, 1, (1960).

ROMERO J. C., "Direct Questions in the Teaching of Conversation", English Lang.Teaching, 20, (1966), pp.109-112.

RUSHTON, E. W. "Programmed Learning in the Schools of Roanoke Virginia", Ontario Journal of Educational Research, 4, (1962), pp.122-138.

RUSHTON, E. W. "The Roanoke Experiment", The Nations Schools, 67, (1961), pp.76-79.

SALTZMAN, IRVING J., "Programmed Self-Instruction and Second Lang. Learning", International Review of Applied Linguistics, 1, (1963), pp.104-114.

SALTZMAN, IRVING, "Techniques Use in the Construction of a Completely Self-Instructional, One-Semester, Modern College Course in Russian", SDLL, IJAL, 29, (1963), pp.2. Part 3.

SALTZMAN, IRVING, J.; BEEBE, JOHN F., and BERN, HENRY, "The Construction and evaluation of a Self-instructional program in Russian", Project No. 658 (NDEA 7), (1961-1963).

SALTZMAN, IRVING J., "Programmed self-instruction and second Language Learning", International Review of Applied Linguistics in Lang.Teaching, 1, (1963), pp.104-114.

SALTZMAN, IRVING J.; BUCK, GEORGE C.; and BONGART,KLAUS, H., "Observations on the use of 3 self-instructional programmed FL Courses", AV Communication Review, 13, (1965), pp.53-58.

SCHERER, GEORGE, A. C., "Final Report extended classroom experimentation with varied sequencing of the four skills in German instruction", OE Contract No. SAE 8823, (1960-1962), pp.270.

SCHRAMM. WILBUR, "PI in Denver", Four Case Studies in PI," pp.29-39.

SCHRAMM, WILBUR , "Programmed Instruction today and tomorrow", The Fund for the Advancement of Education, (1962), pp.74.

SCHULTZ, ROBERT E.; BAKER, ROBERT L; and GERLACH, VERNON, S., "Teaching Capitalization with a programmed text",AV Communication Review, 10, (1962), pp.359-362.

SEEDOR, M. M. "Programmed Instruction for nursing", Pa.Univ.Schoolmens Week Proc., 49, pp.57-65.

SHETTEL, H. H. and LINDLEY, R. H. An Experimental Comparison of Two Types of Self-Instructional Programs for a SAGE System Paired-Associate Task, American Inst. for Research (1961), (Contract AF 19 (604) - 5951).

SHETTEL, H. H. Final Report: Self-Instructional Programs for SAGE System Operators, American Institute for Research, (1961).

SIDMAN, M; KELLER F. S.; KENNEDY, E. J. and WILSON M. P., "Teaching morse code reception with signals weight in frequency according to their difficulty", Journal of Applied Psychology, 39, (1955), pp.1-4.

SMITH, M. DANIEL, "Some considerations in teaching mathematics by PI", The Mathematics Teacher, (1962), pp.232-245.

SMITH, M. D. The Earlham Self-Instruction Project: A Report of Activity and Progress, Earlham College (1961).

STAVE, ALLAN M., "Automatic programming and recording in training equipment", A Case History and some implications presented at Meeting of the American Psychological Assen., Chicago, (1960).

STEVENS, KIMBLE, "Square like crazy in 4 minutes", Pageant, (1961).

STOLUROW, LAWRENCE M., "Automated Teaching of Sight Vocabulary", Read at APA Meeting (1961).

SWEET, WALDO E., "Programmed Learning", Language Learning, 11, (1961), pp. v-ix.

SWEET, WALDO E., "Programmed Learning in Latin", The Foreign Language Courier, (1961), pp.4-6.

TABER, J. I. and GLASER R., "Exploratory evaluation of a discriminative transfer learning program using literal prompts", J.Ed. Res., 55, (1962), pp.508-12.

TABER, JULIAN 2, and GLASER ROBERT, "An Exploratory evaluation of a discriminative transfer learning program using literal prompts", Uni. of Pittsburgh,PA Cooperative Research project 691 (1961), (9417), USOE.

THELEN, HERBERT, and GINTHER JOHN R., "Experiences with Programmed materials in the Chicago Area", Four Case Studies of PI, pp.41-62.

THOMSON, F. PAUL, "Teaching Systems and Technician Engineers", Journal of the Institution of Electrical and Electronics Technician Engineers, 1, (1965?,

THOULESS, R. H. "The Psychology teaching programme of Holland and Skinner, Aust.J. Psych., 14, (1963), pp.85-91.

TOLCH, C. J. "Methods of Programming Teaching Machines for Speech", The Speech Teacher, 11, (1962), pp.233-238.

TROUT J., Programs: Auto-instructional - "Programming practitioners relate variety of experiences: Tips for program uses (av department included)", Av.Instr., 8, (1963), pp.404.

TURNBULL, G. H. "The use of a programmed textbook in psychology with training college students", Education for Teaching, 62, (1963), pp.60-62.

VALDMAN, ALBERT, "Breaking the Lockstep", IJAL, 29, (1963), 2,Part 3.

ZIERER, ERNESTO, "Instruccion Programada", Universidad Nacional de Trujillo, Trujillo, Peru, (1964).

WARREN, N.; ATKINS D. W.; FORD J. S. and WOLBERS H. L., "Development of a training program for teaching basic principles of trouble shooting", Technical Memo, Armament Systems Personnel Research Lab. AFPTRC Lowry Air Force Base, Colo., ASPRL-TM-55-19, (1955).

WEIGALL, R., "Investigation into programmed spelling", Ed.Mag., 21, (1964), pp.149-150.

WEISS, WALTER; MACCOBY, NATHAN and SHEFFIELD FRED D., "Combining practice with demonstration in teaching complex sequences: serial learning of a geometric construction task", SPI, (1961), pp.55-76.

WEISS, EDWARD C., and WULFF J. JEPSON, "Development and evaluation of an automated tutoring course for on-site training of maintenance technicians", Psychological Research Associates, Inc., Arlington, Virginia, (1960).

WITTROCK, M. C. "Response mode in the programming of kinetic molecular theory concepts", J.Ed. Psych., 54, (1963), pp.89-93.

WURTZ, R., "Teaching machine for driver training", Calif.J.Sec.Ed., 35, (1960), pp.301-4.

YOUNG, J. A. Value - "Both can benefit student and teacher", J.Chem.Ed., 40, (1963), pp.11-13.

YOUNG, JAY A., "PI in Chemistry", Journal of Chemical Education, 38, (1961), pp.463-465.

ZABORSKA, M. "Photosynthesis", Grade Teach., 80, (1963), pp.36-7+.

ZABORSKA, M. "Synonyms, antonyms, homonyms", Grade Teach., 80, (1962), pp.28-9+.

TEACHING MACHINES

Audio-Visual Aids and Modern Language Teaching, (1962), Recommended by Gerald Fleming for Making Charts for Lang. Instruction.

"Audio-Visual Aids and Modern Lang. Teaching", National Committee for Audio-Visual Aids in Education, (1962), pp.48.

"National Committee for Audio-Visual Aids in Education", Visual Education, (1961 and 1962), pp.46.

"Audio-visual aids and Staff Training in Industry", International A-V Technical Centre International Colloquy, (Lectures).

"Audio-visual Aids and Staff Training in Industry", International A-V Technical Centre International Colloquy, (Technical Report).

AV Communication Review, 10, (1962).

"Special Number on AV Instruction and the Language Arts", Audiovisual Instruction, 5, (1965).

"Audio-Visual Techniques and the Lang. Lab.", The Journal of Educational Sociology, 35, (1962), pp. 271-7.

"Audio-visuele Hulpmiddelen. Toepassings-mogelijkheden van audio-visuele Hulpmiddelenbij het voorbereidend Hoger en Middelbaar Onderwijs", Stichting Contactcentrum Bedrijfsleven Onderwijs, pp.34.

"The Autotutor Mark II", Technical Education, 3, (1961), p.22.

"Automation in the Classroom", Financial World, 21, (1960).

"Das Bild mein Sprachlehrer", Sekundarlehrerkonferenz, (1956.)

"Centre Audio-Visuel de la langue fr", Athenee Royal De Wavre.

"Le Centre Audio-Visuel de l'Ecole normale Superieure de Saint-Cloud", Le Francais dans le Monde, 2, (1963),

"Le 'certificat de phonetique' delivre a l'university de Grenoble", International A-V Technical Centre, Col 63/WD 5/5 annexe, 2, 4 pages.

"Le Cinema pour L'enseignement du Fr.", Ecole Normale Superieure de Saint Cloud.

"The Coming Boom in teaching Machines", Control Engineering, (1960).

"A Comparative Study of Teaching Machines and Classroom Instruction in a Naval Training Establishment", Great Britain: Admiralty, Manpower Dept. Senior Psychologists Division.

La Documentation par l'Image", Fernand Nathan, Paris, 21 (1960), 24, (1962), 25, (1963).

"The Dyna-slide program Scanner", Dyna Slide Co. Bulletin, (1960).

"Electronic Teaching Machines - Blessing or Curse", Popular Electronics, (1960), pp. 60-63, 130-132.

L'emploi des auxiliaires visuels dans l'enseignement de base. Compte-rendu du Congres de Messine, United Nations Educational, Scientific & Cultural Organization, (1954).

NIPPON HOSO KYOKAI, "Explanatory notes on Nippon Hoso Kyokai Radio and TV Language Programs", International A-V Technical Centre, Col. 63/VD 6/1, 6 pages.

"Exploratory Studies in the Uses of Pictures and Sound for the Teaching of Foreign Languages", Dept. of the Navy, (1953).

"For Brighter Students - Teaching Machines?", Newsweek, (1959).

"Here is deluxe version of a computer-type Teaching Machine", Mid-Hudson Channel, 10, (1961), p.21.

"How far are we going with Machine Teaching", Personnel Journal, (1960).

"Science Research Associates", How to Use the Reading Ease Calculator, (1950).

"Image Auditive et Image Visuelle", Taalonderwijs, 3, (1959), p.177.

"Implications of the Teaching Machine for Firemanship Training", Fire Engineering, (1961).

Information Bulletin 7, Foringer & Co.Inc., (1959).

"Learning Theory and A-V Utilization", Audio-Visual Communications Review, 9, (196 ).

"Machine taught electronics", Electronics Illustrated (1961).

"Machines for Language Teaching", Sch. & Soc., 88, (1960), p.408.

"Min/Max Teaching Machine - Teaching Materials Corporation", TMI Grolier, NY.

New Teaching Aids for the American Classroom - A Symposium, "The Institute for Communication Research, Stanford Uni, (1960).

New Teaching Aids for the American Classroom, United States Dept. of Health Education and Welfare, Office of Education, New York, (1959). Institute for Communication Research, Standord Uni, (1960).

"Papers of the Regional Research Conference", Newer Educational Media, The Pennsylvania State Uni. in co-operation with the USDept. of Health, Ed. & Welfare, (1961).

"Now the Teaching Machine", United States Review, (1960), pp. 3, 22.

"Principles of video-sonic systems", Hughes Aircraft Co., (1961).

"Professor Skinner's Teaching Machine", Fortune, (1958).

"Push-button brains", Newsweek, (1959).

"Rapport d'activite", Institut de Phonetique, Faculte des lettres de Grenoble, (1961-1962).

Rapport sur les activites du CREDIF pour l'annee (1961), Saint Cloud, (1962).

"Realist - Methode audio-visuelle intuitive, psychologique, sans l'emploi des traductions", *Centre D'Information et de Diffuision de l'Enseignement Moderne*.

"Realistic Advice for TV Users", Ceto *Bulletin*, (1963).

"A Report on two Kinds of Teaching Machines", *School Management*, 4, (1960), pp. 61-62, 64.

"Research findings in teaching by machine", *Ind. Arts & Voc. Ed.*, 52, (1963), 52+.

"The Roanoke Virginia Experiment with Teaching Machines", *Mid-Hudson Channel*, 10, (1961), p.19.

"Robot instructors Win Friends and Speed Assembly", *Factory*, (1960).

"Schoolman's Guide to Teaching Machines", *School Management*, 5, (1961), pp. 90-113.

"Self-Instruction with Teaching Machines", *Am.Lib. Assn.Bul.*, 55, (1961), p.121.

"Self-instructional Devices", *Audio-visual Instruction*, (1961).

"Self-teaching Devices", *Carnegie Corporation of NY Annual Report*, (1960), pp. 40-41.

"Skinner Demonstrates Teaching Machines", *Phi. Delta Kappan*, 39, (1957),

"Summer Meeting Stresses Technology Theme", *Av.Instr.*, 6, (1961), pp.352-3.

"The Teacher and the Machine", *Journal of Educational Research*, 55, (1962), pp.405-531.

"The Teacher in the Automatic Box", *Overview*, 2, (1961), pp. 46-9.

"Teachers for Tomorrow", *Bulletin 2*, (1955), p.40.

"Teaching by Machine: And How they do it in America", *Il. Times Ed. Sup.* 2385, (1961), p.199.

"Teaching Machine", *The New York Times*, (1960).

"The Teaching Machine", *Education Summary*, (1960).

*Teaching Machine*, (filmstrip; technical adviser, A.A. Lumsdaine), Pasadena, Calif.: Basic Skill Films.

"Teaching Machine Experiment in Fire Training", *Fire Engineering*, (1961).

"The Teaching Machine for Employee Development" *Personnel Journal*, (1961).

"Teaching Machines", *The Indiana Teacher*, (1960).

"The Teaching Machines", *Time*, (1960).

"Teaching Machines", *J. Bsns. Ed.*, 36, (1961), p.182.

"Teaching Machines (proc.) Florida", University,College of Education. Education Library, pa 20c (1960). The Lib. Gainesville, Bibliography.

"Teaching Machines: Association for Programmed Learning Meets." Times Ed. Sup., 2446 (1962), p.685.

"Teaching machines and auto-instructional programs. Joint committee of the American Educational Research Assoc., the American psychological asscn., and the Dept. of audiovisual instruction of the National education asscn.", Av.Comm.R., 9,(1961), p.206-8, Same, Av.Instr., 6, (1961), pp.358-9, Minn J. Ed., 42, (1961), p.22, NEA J., 50, (1961), p.19., Art.Ed., 14, (1961), pp.25-6, Pa. Sch.J., 110, (1961), p.134, Phi Delta Kappan, 43, (1961), pp.145, Mus.Educators J., 48, (1962), p.90, Social Ed., 26, (1962), p.37-9, Sch. & Soc., 90, (1962), p.94.

"Teaching Machines: An old technique in a New Setting", School District No Six Principals' Study Group.

"Teaching Machines and Programmed Learning: Symposium", Il. Times Ed.Sup., 2500 (1963), pp.803-8, Discussion, 2505, (1963), p.1143; 2507 p.1263.

"Teaching Machines and Programmed Learning. 1962 A Survey of the Industry", National Education, Technological Development Project' Occasional Paper No.3.

Teaching Machines and Texts", Kansas Teachers, (1960).

"Teaching Machines are a Threat to Teachers", School Management, 4, (1960), pp. 41-43.

"Teaching Machines: For Brighter Students?", Newsweek, (1959).

"Teaching Machines - Gadgets or Valuable Timesavers for Teachers?", Mid-Hudson Channel, 10, (1961),p2.

"Teaching Machines permeate convention sessions", AV Instruction, (1961).

Teaching Machine Technology, presented to quarterly training seminar, May, 1961, 2563rd Air Reserve Center, USAF.

Encyclopaedia Britannica Films Inc., TEMAC FL Teaching, Press Release (1960).

"Tireless Tutor", New Yorker, (1960).

"Tools for Education", Overview, (1960), p.74.

"Trumped-Up School, "Time, (1961), p.42.

*Using Teaching Machines to promote Student Self-Instruction in Secondary Schools: Symposium", J. Sec. Ed., (1962), pp.106-28.

"Visual Aids in Fundamental Education: Some Personal Experiences", United Nations Educational, Scientific and Cultural Organization, (1952), pp.168 + illustrations.

"The Western Design Tutor", Western Design, California.

"What is a Teaching Machine?", Teaching Machines Corp. (Div.of Grolier).

"What is the potential of AV devices?", Av Instruction, (1961).

"Will Teaching Machines Revolutionize Education?", Michigan Education Journal, 38, (1960), pp. 300-301.

ADAMS, EDMUND B., "The Shakedown of a Teaching Machine", Automated Teaching Bulletin, 1, (1961), pp.26-27.

ADAMS, SAM, "A Fable of the 80's", National Education Assen. Journal, 50, (1961), pp.24-25.

ALLEN, W. H. "Research on Film Use: Student Participation", AV Communication Review, 5, (1957), pp.423-450.

ANGELL, GEORGE W., and TROYER, MAURICE E., "A New Self-Scoring Test Device for Improving Instruction", School & Society, 67, (1948), pp. 66-68.

ANNETT, JOHN, "Teaching Machines in Industrial and Military Training", AUSTWICK, KENNETH (ed.)., Teaching Machines and Programming, (1964), pp.43-78.

ANNETT, JOHN; KAY, HARRY; SIME, MAX; "Teaching Machines", Discovery, 22, (1961), pp.191-198.

AUSTWICK, KENNETH, "Automation in Schools", AUSTWICK, KENNETH (ed.), Teaching Machines and Programming, (1964), pp.205.

AUSTWICK, KENNETH, "Programmed Learning - Some First Impressions", Teaching Machines and Programmes, (1962).

BABCOCK, CHESTER D., "The Teacher, TV, and Teaching Machines", National Education Journal, 49, (1960), pp. 30-31.

BALDWIN, H. W. Electronic Visual Audi-training Aid, Fort Huachua, Arizona, US Army Electronic Proving Ground, Contract DA 36-039-SC-80146.

BALDWIN, H. A. A Self-programming Teaching Machine, read at the Southeastern Universities Computer Conference, Uni. of Arizona, Mr.1960.

BAMFORD, H. E. Jr., The Use of Training Aids in Conceptual Training, American Institute for Research (1955).

BARD, BERNARD, "The Teaching Machine", New York Post, (1961).

BARLOW, JOHN A., Aspects of Programming: Learning and Performance Unpublished Paper, presented at the American Psychological Assen. Meeting (1960).

BARLOW, JOHN A., "Aspects of Teaching Machine Programming: Learning and Performance", Psychological Review, 2, (1961), pp. 43-46.

BARLOW, JOHN A., "The Impact of Teaching Machines on Educational Philosophy: from "sponge and sieve" to self-serve spoon feeding", Based on a paper read at the Ohio Psychological Assen., Indiana, (1960).

BARLOW, JOHN A., "A new form of Pressey Multiple-choice board", Psychological Reports, 6, (1960), pp. 214.

BARLOW, JOHN A., "New Instruction Media: Self-instruction, guided instruction, and the role of the Teacher", *Project Description*, HEW Project No. 7-12-026.00 (1959).

BARLOW, JOHN A., "Project Tutor", *Psychological Reports*, 6, (1960), pp. 16-20.

BARLOW, J. A. "The Teacher and the Teaching Machine", *Aid*, 1, (1961), pp. 5-6.

BARLOW, J. A. "Teaching Machines and Educational Philosophy", *School & Society*, 89, (1961), pp.201-2.

BARNARD, D. P. "Audio-visuals", *Ind. Arts & Voc.Ed.*, 52, (1963), pp.10+.

BEGGS, D. W. "Teaching Machines and Programmed Learning", *M.L. Miller il Ill Ed.*, 50, (1961), pp. 165-70.

BELTON, J. R. "Testing Teaching Machines and Programed Learning in the Classroom", *Bibliog. Nat. F. Brin.*, 42, (1963), pp.28-31.

BENDICK, MARC., "Automated Instruction: Hardware and Logic Unpublished Paper" presented at the Society of Motion Picture and Television Engineers' Meeting, California, (1960.

BERINGAUSE, A. F. "Teaching Machine", *H.Points*, 43, (1961), pp.21-4.

BESNARD, G. G.; BRIGGS, L. J.; MURSCH, G. A.; WALKER, E. S.; "Development of the Subject-matter trainer Technical Memorandum, Arnament Systems Personnel Research Lab., AFPTRC, Lowry Air Force Base, Colorado (1955).

BESNARD, G. C.; BRIGGS, LESLIE J.; and WALKER, L. S., "The Improved Subject Matter Trainer Technical Memorandum, Arnament Systems Personnel Research Laboratory, AFPTRC, Lowry Air Force Base, Colorado, (1955).

BENSON, EUGENE W., and KOPSTEIN, FELIX F., *Machine Teaching of basic electronics at Kessler AF Base: an Experiment* , Paper presented at Convention of Dept. of AV Instruct. NEA (1961), pp.5.

BLANK, STANLEY S., "Teaching Machine: What have Studies in the Classroom shown?", *California Journal of Educational Research*, (1961), pp.99.

BLYTH, J.W., "Teaching Machines and Human Beings", *Teaching Machines and Programmed Learning"*, eds. A.A. Lumsdaine and R. Glaser, (1960), pp.401-15.

BLYTH, JOHN W., "Teaching Machines and Logic", *American Mathematical Monthly*, 67, (1960), pp. 285-287.

BOEHM, G.A.W., "Can People be Taught Like Pigeons?", *Fortune*, (1960).

BORG, WALTER R., and CRAGUN, JOHN R., "The Teaching Machine as a Study Aid", read at the *American Psychological Asscn. Meeting*, (1961).

BOROFF, DAVID, "The three R's and Pushbuttons", New York Times Magazine, 25, (1960).

BOROW, H., "Automated Learning and the Counselor", Bibliog. J. Counsel Psychol., 8, (1961), pp. 272-7.

BRALEY, IAN, "Will robots teach your child?", Today's Living, 4, (1960).

BRIGGS, LESLIE, J., "The Probable Role of Teaching Machines in Classroom Practice", Theory into Practice, 1, (1962), p.48.

BRIGGS, LESLIE, J., "Teaching Machines", USAF-NRC Symposium on Education and Training Media, G. Finch, ed., (1960).

BRIGGS, L. J. "Teaching Machines, Education, and Job Skills", Psychological Reports, 5, (1959), p.210.

BRIGGS, L. J., "Teaching Machines; History and Possible Applications to Air Force Education and Training Programs", Paper read at National Research Council Symposium, 18, (1959), pp.51.

BRIGGS, LESLIE J., "Teaching Machines for Training of Military Personnel in Maintenance of Electronic Equipment", Automatic Teaching: The State of the Art, E. Galanter, ed., (1959), pp. 131-45.

BRIGGS, LESLIE, J., "Teaching Machines and the Training of Space Crews", American Institute for Research, Santa Barbara, (1960).

BRIGGS, LESLIE, J., "A Troubleshooting Trainer for the E-4 Fire Control System", Technical Memorandum, Maintenance Lab., AFPTRC, Lowry Air Force Base, Colorado, (1956).

BRIGGS, LESLIE, J., "Two Self-Instructional Devices", Teaching Machines and Programmed Learning, eds. A.A. Lumsdaine and R. Glaser, (1960), pp.299-304.

BRIGGS, L. J.; PLASHINSKI, D. ; and JONES, D. L. "Self-pacing versus automatic pacing of practice on the subject matter trainer", Unpublished paper, cited in - DARBY, C. L., An annotated bibliography on the automation of instruction. (1959).

BROUDY, HARRY S., "Socrates and the Teaching Machine", PHI DELTA KAPPAN, 44, (1963), pp.18-25.

BRYAN, GLENN, L.; BOND, N. A. Jr.; LA PORTE, H. R., Jr.; and SUMMERS, S., "The Automasts: An Automatically-recording test of electronic troubleshooting, technical report 2, (1957).

BURROUGHS, ELAINE L., "Experiments with the Applications of Audio-visual and Automatic Devices to the Teaching of French", Project No. 535 NDEA, 7, (1960-1961).

BUSH, R. N., Schools without teachers: an essay on the Teaching Machine", *J. Sec.Ed.*, 37, (1962), pp.65-8.

BUSHNELL, DON D., and COGSWELL, JOHN G., "Computer-based Laboratory for Automation in School Systems", *System development Corp.*, (1961).

BYLINSKY, GENE, "Robot Teachers", *The Wall Street Journal*, (1960).

CAMPION, LEE; FINN, JAMES D; and PERRIN, DONALD, "Studies in the Growth of Instructional Technology 1", Audio-visual Instrumentation for instruction in the Public Schools (1930-1960), Occasional Paper No. 6, Washington, DC, NEA Technical Devpt. Project (1962).

CARCY, W. F., "Problems of misunderstanding - Mechanical aids to technical presentation", Year Book of Education, (1960), pp.86-93.

CARPENTER, C. R., *The Classroom Communicator*, Technical Report SDC269-7-14), (1950). pp. 598.

CARPENTER, FINLEY, "How Will Automated Teaching Affect Education?", *The University of Michigan School of Education Bulletin*, (1959), pp.598.

CARPENTER, F., "Teaching Machine", *Bibliog. Am. Assn. Col. Teach. Ed. Yrbk.*, (1960), pp. 114-24.

CARPENTER, FINLAY, "The Teaching Machine and its education significance", Read at 12th annual Meeting of the American Assen. of Colleges for Teacher Education, (1960).

CARPENTER, FINLEY, "Teaching Machines and Programmed Instruction Syracuse:" The Library of Education, Center for Applied Research in Education (1963).

CARROLL, JOHN B., "Initial Specifications for an audio-visual automated teaching device", *Society for the Investigation of Human Ecology*, (1959).

CARTER, L. F., "Automated Instruction", *American Psychologist*, 16, (1961), p.705.

CASS, JAMES, "New Tools for Teaching", *Saturday Review*, (1961), pp.60-61, 75.

CASSEL, R. N., and ULLOM W. L., "Preliminary Evaluation of an Automatic Tutoring Machine", *J. Sec. Ed.*, 37, (1962), pp. 117-24.

CASSIDY, VIOLA M., "The Effectiveness of self-teaching devices in facilitating Learning", *Ph. D. Thesis, Columbus, Ohio*, (1950).

CAVANAGH, P. (Ed.), "The Auto Tutor and Classroom Instruction: Three Comparative Studies", *Occupational Psychology*, 37, (1962), p.44.

CLARK, E. C., "Teaching Machine and Programmed Materials", *Il Cath. Sch.J.*, 61, (1961), pp. 17-19.

COGSWELL, J.F. and BUSHNELL, D.D., "The Class System at SDC", *Aid*, 1, (1961), pp.42-44.

COLLINS, J.J., "Experiment in the Use of Teaching Machines", *Jun.Col. J.*, 33, (1962), pp. 73-7.

CONOLEY, COLLEEN; KING, F., and REID, JACKSON B., "An Evaluation of Two Principles involved in programmed Learning Devices", Uni. of Texas, Austin.

COOK, DESMOND L., "Teaching Machine Terms: A Glossary", Audiovisual Instruction, 6, (1961), pp. 152-53.

CORRIGAN, ROBERT E., "Automated Teaching Methods: A Review of Fundamentals, concepts and Developments", Automated Teaching Bulletin, 1, (1959), pp. 23-30.

CORRIGAN, ROBERT E., "Automated Teaching Methods: A Solution to our Educational Problems", Rheem Manufacturing Co.

CORRIGAN, ROBERT E., A Dilemma: How to Provide quality education for the Individual Student within an ever-expanding Mass Educational System, Corrigan & Associates Inc.

CORRIGAN, ROBERT E., "Teaching Machines and Automated instructional Methods", Journal of the American Society of Training Directors ,(1960).

COULSON, JOHN E., "An Experimental Teaching Machine for Research at SDC", Technical Memorandum, (1959).

COULSON, JOHN E., and SILVERMAN, HARRY F., "Proposal for extension of automated teaching projects", Field Note, System Development Corp. (1959), pp. 606-7.

CRAGUN, J. R. "The use of the Teaching Machine as a Study Aid at the College Level and some Related Implications", MA Thesis, Utah State Uni. (1960).

CREORE, FRANCES B., "The New Media in Lang. Teaching, A Status Study", Audiovisual Instruction, (1960), pp. 286-293.

CROWDER, N. A., "Intrinsically Programmed Teaching Devices", In Invitational Conference on Testing Problems. Proceedings, (1952), pp. 40-52.

CROWSER, NORMAN A., "Teaching Machines are a Threat to Teacher", School Management, (1960).

CROWDER, NORMAN A., "The Tutor", Journal of the American Soc. Training Directors, (1960).

COX, H. W., and ROE, A., Basic properties of an automated teaching System, (1964).

DAVIS, NANCY H., "A Second Teacher", AV Instruction, 6, (1961), pp.134-135.

DAY, J. H., "Teaching Machines", Journal Chemical Education, 36, (1959), pp. 591-595.

DAY, J. H. Teaching Machines , Unpublished paper, Ohio Uni., Athens, (1959).

DECKER, BERT J., Teaching Machines and Creative Behavior , 7th Creative problem-solving Inst. (1961).

DE FERRANTI, M.Z., "Teaching Machines: A Challenge of instructional Technology", Leader, 2, (1961), pp. 49-51.

DE KIEFFER, R., "Teaching Machines, Self-instruction devices", Colorado School J., (1961).

DESBERG, DAN, "Automaticity: Lang. Learning Goal", Educational Screen and Audiovisual Guide, (1961), pp. 172-174.

DODD, B. T., "The Adolescence of the Teaching Machine", New Era, 44, (1963), pp. 123-131.

EATON, DONALD D., "Teaching Machines", Cirriculum Bulletin, 17, (1961), (Bibliog).

ECKER, D. W., "Teaching Machines and Aesthetic Values", Bibliog. Studies Art. Ed., 3, (1962), pp. 8-15., Same, Ed. Theory, 12, (1962), pp.17007.

ECKSTRAND, GORDON A.; ROCKWAY, MARTY R.; and MORGAN, ROSS L., "Teaching Machines in the Modern Military Organisation", API, (1962), pp. 78-103.

EDWARDS, R., "Teaching Machines and Programmed Instruction", Bibliog. Can. Ed. Res. Digest, 3, (1963), pp. 262-78.

EDWARDS, W. D. "Skinner's Teaching Machines", AFPTRC Maintenance Lab. Lowry Air Force Base, Unpublished Lab. Note, (1956), pp. 611-4.

EIGEN, LEWIS, D., and KOMOSKI, P. KENNETH, "Teaching Machines can aid the Schools to make better use of Teacher's time", California Journal of Secondary Education, 35,(1960), pp. 252-254.

ELSLANDE, H. R. VAN, "Audio-visuele Media bij het Talenonder-richt", (1963), pp. 9.

ELY, DONALD P. (ed.), "The Changing Role of the AV Process in Education: A Definition and a Glossary of Related Terms", AV Communication Review, 2, (1963), Supplement 6,

EPPS, H. O.; MC CAMMON, G. G.; and SIMMONS Q. D., Teaching devices for Children with impaired learning, Columbus Ohio, Parents Volunteen Asscn. (1958), pp.81.

EPSTEIN, SAM & BERYL, "The First Book of Teaching Machines", Franklin Watts, (1961).

ERICKSON, CARLTON. W. H., Administering Audio-visual Services , Memn (1959).

ERICKSON, R. J., "Watch those Teaching Machines", Ed. Forum, 27, (1963), pp. 183-7.

EVANS J. L. "An Investigation of 'Teaching Machine' Variables Using Learning Programs in Symbolic Logic", Unpublished doctoral dissertation, Univ. of Pittsburgh (1960).

EXTON, ELAINE, "Teaching Machines, Fad or here to stay", American School Board Journal, 141, (1960), p.18-22.

FALCONER, G. A., A Machine for Teaching Word Recognition to young deaf children , Allerton Park Conference on Automation in Special Education, (1960).

FALCONER, G. A. "A Mechanical Device for teaching word recognition to young deal children," Ed. D. thesis Uni. of Illinois, (1959).

FALCONER, G. A. "Teaching machines for the Deaf", Volta, 62, (1960), pp. 59-62+.

FATTU, N. A. "Automation devices in College Teaching", Sch. & Soc., 88,(1960), pp. 435+.

FATTU, NICHOLAS A. Potential contribution of Technology to Education read at American Psychological Assen. Meeting (1961).

FATTU, N. "Training Devices", Encyclopedia of Educational Research, (1960), p.621.

FELDHAUSEN, JOHN F., Problems Schools will face in planning to use Teaching Machines, Education of Administration and Supervision.

FELDHUSEN, JOHN F. "Taps for Teaching Machines", Bibliog Phi. Delta Kappan, 44, (1963), pp.265-7, Same Cond. Ed. Digest, 28 (1963), pp.11-13.

FELDHUSEN, JOHN F. "Will Teaching Machines product maching Teaching", Wisconsin Journal of Education, 93, (1960), pp. 18-20.

FERENCZI, VICTOR and RIVENC, PAUL, "Experiences sur le role du film anime dans l'enseignement du Francais aux etrangers", Ecole Normale Superieur, St. Cloud.

FERENCZI, VICTOR, and RIVENC, PAUL,"Experiences sur les attitudes de l'auditoire face au film anime destine a l'apprentissage du Francais. Ecole Normale Superieur, Saint Cloud (1960).

FERRER, TERRY, "Can Machines Really Teach?", New York Herald Tribune, (1960).

FEUER, I. J. "Teaching Machines and programmed learning", H. Points, 44, (1962), pp. 33-9.

FILBY, YASUKO, and EDWARDS, ALLEN E., "An Application of Automated-Teaching Methods to Test and Teach Form Discrimination to Aphasics", The Journal of Programmed Instruction, 2, (1963), pp.25-34.

FINCH, G. (ed.), Educational and Training Media: A Symposium , Washington DC Nat.Academy of Sciences - Nat. Research Council (1960), p.621.

FINCH, G. and CAMERON F., (eds.) "Symposium on Air Force Human Engineering, Personnel and Training Research, Washington DC National Research Council 455, (1956), ARDC Tech. Report 56-8 TMPI 622.

FINCH, G., and CAMERON F. (eds.), "Symposium on Air Force Human Engineering, Personnel, and Training Research, Washington DC National Research Council 516, 1958 (2nd volume for N 15-16, 1956 symp).

FINE, BENJAMIN, "Teaching Machines", Sterling, NY, (1962), Oaktree Press, London, (1963), pp.176.

FINN, JAMES D., *The Audio-visual Equipment Manual* , The Dryden Press, NY, (1957).

FINN, JAMES D., "Automation and Education I: General Aspects", *AV Communication Review*, 5, (1957), pp. 343-360.

FINN, JAMES, D., "Automation and Education II: Automatizing the classroom - background of the effort", *AV Communication Review*, 5, (1957), pp. 451-467.

FINN, J.D., "Automation and Education: Part 3, Technology and the Instructional Process", *AV Communication Review*, 8, (1960), pp.5-26.

FINN, JAMES D., "Educational Technology - a new force", *ALA Bulletin*, (1961).

FINN, JAMES D., "From Slate to Automation", *AV Instruction*, 4, (1959), pp. 84-85, 100-101.

FINN, JAMES D., "A Look at the future of AV Communication", *AV Communication Review*, 3, (1955), pp.244-256.

FINN, JAMES D., "Teacher understanding - Key to the new Technology", *California Teachers Assen. Journal*, 56, (1960), p.5.

FINN, J.D., "Teaching Machines: Auto-Instructional Devices for the Teacher", *NEA Journal*, 49, (1960), pp.41-44.

FINN, JAMES D., "Technology and the instructional Process", *AV Communication Review*, (1960).

FINN, JAMES D., "Technology and the Instructional Process", *Phi. Delta Kappan*, 41, (1960), pp.371-378.

FINN, JAMES D., and RICHARDSON, ELINOR, "The Principal faces the new Technology", *The National Elementary Principal*, 40, (1961), pp.18-22.

FINN, JAMES D., and PERRIN, DONALD G. *Teaching Machines and Programmed Learning,* A Survey of the Industry, NEA, Washington (1962).

FITZGERALD, H. T. "Teaching Machines: A Demurrer", *Sch. R.* 70, (1962), pp.247-56, *Same Cond. Ed. Digest*, 28, (1962), pp. 5-8.

FLEMING, GERALD, "Notes for Teachers using Wall Pictures for Guided Composition, LUP London, (1957), pp.28.

FLEMING, GERALD, "Teachers' Guide", Guided Composition, U.L.P. (1957).

FLEMING GERALD, "The Wall Picture and animated film cassette as valuable aids to lang. learning", *International A-V Technical Centre*.

FLEMING, GERALD, "The Wallpicture as a valuable aid in the language lesson". In praxis, (1960).

FLORY, JOHN and HOPE, THOMAS W., "Non-theatrical films - interim report 2", *Journal of the SMPTE*, 70, (1961).

FOLLEY, JOHN D. (ed.), "Human factors methods for system design", *Report AIR-290-60-255*. The American Inst. for Research, Pittsburgh (1960).

FOLTZ, CHARLES I., "Aids to teaching: A Survey of the Current Status of teaching machines", API, (1962), pp.219-240.

FOLTZ, C. I. The World of Teaching Machines, Washington, D.C.: Electronic Teaching Laboratories, (1961).

FRAZIER, A., "Opinions differ; Technology in Education", NEA, 49, (1960), 73,

FRITZ, J., "Educational Technology: A Way to its Assessment", Administrator's Notebook, 9, (1959), 5.

FRY, EDWARD BRYAN, California Teachers Association Journal, 56, (1960), pp.14-15+.

FRY, EDWARD BRYAN, "The Mechanical Teacher", The Texas Outlook, 44, (1960), pp.10-11.

FRY, EDWARD, B. "Research Tools: Instrumentation in Educational Research, Bibliog. R. Ed. Res., 30, (1960), pp.531-21.

FRY, E., "Teaching Machine Dichatomy: Skinner versus Pressey", Psychological Reports, 6, (1960), pp.11-14.

FRY, E.B., and others, Teaching Machines, An Annotated bibliography - Dept. of Audiovisual Instruction N.E.A., (1960), pp.80 TMPI 626.

FRY, EDWARD B., "Teaching Machines; The Coming Automation", The Phi Delta Kappan, 41, (1959), pp.28-31.

FRY, E. BRYAN, "Teaching Machines: An Investigation of constructed versus multiple-choice methods of response", Automated Teaching Bulletin, 1, (1959), pp.11-12.

FRY, E., "Teaching Machines: An Investigation of Constructed versus Multiple-choice Response Modes", unpublished doctoral dissertation, University of Southern California, Los Angeles, (1960), TMPI 625.

FRY, EDWARD B., "Teaching Machines and Programmed Learning", Mc Graw Hill, NY, (1962).

FRY, E. B., "Teaching Machines and Programmed instruction, An Introduction, NY, McGraw-Hill, (1963).

FRYE, NORTHROP, "Push-button gadgets may help - but the teacher seems here to stay", Varsity Graduate, 8, (1960), p.45.

FUSCO, GENE, C., "The Teacher and the Teaching Machine", The Tennessee Teacher, (1960).

FUSCO, GENE, C. "Technology in the classroom; challenges to the school administrator", School Life, 42, (1960), pp.18-23.

GAGNE, ROBERT M., "Teaching machines and transfer of training paper read at Symposium on research issues in the study of human learning raised by developments in automated teaching methods", American Psychological Asscn., Convention, Cincinnati, (1959), * TMPI 626-7.

GALANTER, EUGENE, "The Mechanization of Learning", *National Education Association Journal*, 50, (1961), pp.16-18.

GALANTER, EUGENE, "The Mechanization of Teaching", *NASSP Bulletin*, 44, (1960), pp.301-309.

GILMORE, KEN, "Teaching Machines - Blessing or Curse?", *Popular Electronics*, (1960).

GILPIN, JOHN B., "Design and Evaluation of Instructional Systems Read at the APA Meeting NY, (1960).

GILPIN, J., "Design and Evaluation of Instructional Systems", *Bibliog. Av. Comm. R.*, 10 (1962), pp.75-84.

GINTHER, JOHN R., "Men, Values and the Machine", *Elementary School Journal*, 60, (1960), pp.179-189.

GINTHER, J., "More on Teaching Machines", *El. Sch. J.*, 61, (1961),pp.239-41.

GIRSON, ROCHELL, "Latest on Teaching Tools", *Saturday Review of Literature*, (1957).

GLASER, ROBERT and PHILLIPS, J., "Guided Missile Personnel Research: Report 5: An Analysis of tests of proficiency for guided missile personnel II "The Troubleshooting Board", *American Institute for Research*, (1954), TMPI 637-8.

GLASER, ROBERT, "The Teaching Machine in Industry; A New Technology presented before the San Francisco State College Institute: Training by Automation in Industry (1960).

GLASER, R. "Teaching Machines", *ibid.*, pp.206-14.

GOLDSMITH, M., "Mechanisation in the Classroom: An introduction to teaching machines and programmed learning. London, Souvenir Press, (1963).

GOLDSTEIN M., and CHALMERS, E. L. Jr., *Photo-identification concepts via teaching machine* , Unpublished paper (1960).

GOLDSTEIN, LEO, S. and GOTKIN, LASSAR G., "A Review of Research: Teaching Machines vs Programmed Textbooks as presentation modes", *Articles on Programmed Instruction*, (1962), 8 + iii pp. Article of same title *The Journal of Programmed Instruction*, 1, (1962), pp. 29-37 including bibliog.

GOODMAN, RICHARD , "Types of teaching machines", *Forum*, 6, (1964), p.56.

GOROW, F., "Teaching Machine Theory applied to Learning Statistics", *Californian Journal of Educational Research*, xii (1961), p.67.

GREEN, T. L. *Research in visual education* , Audio-visual education Govt. of India, (1960).

GREENE,H. JAMES and CHERRY, GWENDOLYN S., "Teaching Machines: Total Involvement, Quality Education", *National Association of Secondary-School Principal Bulletin*, 46, (1962), pp.93-96.

GRIEDER, C., "Place and value of teaching machines", *Nations Sch.*, 67, (1961), pp.10+.

Late entry:

GLASER, R., *Teaching Machines and Programmed Learning*, 2, NEA, (1965).

GROPPER. GEORGE L, and LUMSDAINE, ARTHUR A., "An Experimental Comparison of a Conventional TV Lesson with a programmed TV lesson requiring active student response," American Institute of Research, Report 2, (1961).

GUBA, E. G., "Teaching machines are here to stay", TIP, 1, (1962), pp.1-6.

GUNTHER, MAX, "Automation in the Classroom", American Legion Magazine, (1961).

HAAS, KENNETH, B., and PACKER, HARRY Q., "Preparation and Use of A-V Aids", Prentice-Hall Inc., NY, 1946, 3 ed. (1955), xii + 381 pp.

HALL, ROY, M., Automation and the Profession of Education, APA Meeting, (1961).

HARRIS, CHESTER W., "Teaching Machines", The Encyclopaedia of Educational Research, (1960), pp. 1529-1533.

HASTEROK, G. R., Automated Teaching of sightful vocabulary to mentally retarded children, Allerton Park Conference on Automation in Special Education, (1960).

HECHINGER, FRED. M., "Concern with Gadgetry Obscures vital issues of education", New York Times, (1961), p.8.

HENDERSON, G. L. "Independent classroom experiment using teaching machine programmed materials", Math. Teach.", 56, (1963), pp.248-51.

HENRY, W.G. Jr. "What Makes a Teaching Machine Teach?", Audiovisual Instruction, 6, (1961), pp.126-29.

HILL, W. W. Tester-Rater, Self-tutoring Punchboard Device 20-E-2-e, Special Devices Center, Port Washington, N.Y., (1955).

HOLLAND, J. G. "Human Vigilance", Science, 128, (1958), pp. 61-63.

HOLLAND, J. G. New Directions in Teaching-Machine Research, Conference on Application of Digital Computers to Automated Instruction, Washington, (1961).

HOLLAND. J. G. "Practical Methods of Evaluating Teaching Machines and Programs", Teachers College Record, (1961).

HOLLAND. J. G. Teaching Machines: An Application of Principles from the Laboratory, Educational Testing Service, Princeton, (1959), pp.53-69.

HOMME, LLOYD, E. Programmers - "From art to Technology in Teaching-Machine Programming", Bibliog, TIP, 1, (1962), pp. 38-42.

HOMME, LLOYD, E. The Rationale of Teaching by Skinner's Machines, American Pychologist Association Paper (1957), pp. 133-136.

HOMME, LLOYD, E., and GLASER, ROBERT, "Relationships Between the Programmed Textbook and Teaching Machines", Automatic Teaching: The State of the Art, ed. E. Galanter, (1959). pp. 103-7.

HOUGH, J. B. "Research Vindication for Teaching Machines", *Phi Delta Kappan*, 43, (1962), pp. 240-244.

HUBBARD, HUGH W., -"The Healthy Village: An Experiment in Visual Education in West China", *UNESCO*, Paris (1951), pp.119 + illustrations.

HUFFMAN, H., "Putting the teaching machine on paper.", *Bsns. Ed. World*, 41, (1961), pp.13-18.

HUFFMAN, HARRY, "Will Teaching Machines make you obsolete", *Business Education World*, 40, (1960), pp.11-13, 36.

HUGHES, J. L. "Industrial Applications of Teaching Machines", *Journal of the American Society of Training Directors*,15, (1961), pp. 30-40.

HYER, ANNA L., and SNIDER, ROBERT C., "The Profession and the Machine", *California Teachers Assoc. Journal*, (1960).

IRION, A. L. and L. J. BRIGGS, *Learning Task and Mode of Operation Variables in Use of the Subject Matter Trainer*, Air Force Personnel and Training Research Center, Colo., (1957), TMPI 642-3.

KENDLER, HOWARD H., "Teaching Machines and Psychological Theory", *Galanter*, pp. 177-185. TMPI 646.

KENNEDY, WARD, "Electrifying the three R's", *Pageant*, (1961).

KINDER, J. S. *Audio-visual materials and techniques*, American Book Co. (1950).

KINDER, J. S. "AV Research: Where to find it", *AV Communication Review*, 1, (1953), pp. 234-241.

KING, P. E., "Teaching Machines and the Lang. Lab.", *Am. Sch. Bd. J.*, 141, (1960), pp.17-18+.

KLAUS, DAVID J., "Some Economic Realities of Teaching Machine instruction", *API*, (1962), pp.198-207.

KLAUS, D. J. and LUMSDAINE, A. A., *Some Economic Realities of Teaching Machine Instruction*, American Psychological Assoc., Chicago (1960).

KLAUSMEIER, HERBERT J., and LAMBERT, PHILIP, "Teaching Machines and the Learning Process", *Educational Leadership*, 18, (1961), pp. 278-283+.

KLAW, SPENCER, "What can we learn from the Teaching Machines?", *The Reporter*, (1962), pp. 19-26.

KNELLER, GEORGE, F., "Automation and Learning theory", *Bibliog. Sch. R.*, 70, (1962), pp.220032.

KNELLER, GEORGE, *A critical Analysis of technology in education*, APA Meeting, NY, (1961).

KNELLER, GEORGE, F., *Teaching Machines and behavior theory*, Uni. of California.

KOMOSKI, P. KENNETH, "Teaching Machines", *The American Behavioral Scientist* 6, (1962), p.72-77.

KOMOSKI, P. KENNETH, "Teaching Machines and Programmed Reading Instruction", Articles on Programmed Instruction, 24th Annual Reading Conference, Univ. of Chicago, pp.14.

KOMOSKI, P. KENNETH, "Teaching Machines - Answers to your many QQ by one of the Country's Leading Authorities", The Instructor, 70, (1961), p.32

KOMOSKI P. KENNETH, "Text versus machines with a re-interpretation of programmed instruction", Av. Instr., 7, (1962), pp.373-5.

KOMOSKI, P. KENNETH, "What is a Teaching Machine?", The American Behavioral Scientist, Articles on programmed Instruction, (1962).

KOWITZ, GERALD, T. "Administering the automated school", American School Board Journal, 142 (1961), pp.13-16.

KREIG, MARGARET B., "What about teaching machines?", Parents Magazine, (1961).

KRONES, ROBERT; SAWYER, JESSE O.; and GROSJEAN, GLEN M., "On the Use of Low-Frequency Tones for Marking Lang. Lab. Tapes", Language Learning, 14, (1964), pp.51-54.

KROPP, R. P. and CURTIS, H. A. "Teaching with Machines", Florida Education, (1960).

KUHNS, ROGER J., Teaching Machines are viewed by the Electronics Industry', American Institute of Graphic Arts, (1960).

KVARACEUS, WILLIAM C., "Future Classroom - an Educational Automat?", Educational Leadership, (1961).

LANGE, PHIL. "Guide Lines for appraising the promise of teaching machines", Mid-Hudson Channel, 10, (1961), pp.17-18.

LARRICK, NANCY, "TM - a progress report", Library Journal, (1961),

LEE W. R. "The Synchroreader", The Yearbook of Education, eds. Beredays, George A. F. and Lauwerys, Joseph A. (1960), pp.482-491.

LEEDHAM, J. F. "Experimental work with teaching machines", Forum, 6, (1964), pp.51, 53-58.

LEIGHTON, FRANCES SPATZ, "Remote Control Learning", The American Weekly, (1961).

LEVINE, S. L. and SILVERN, L. C., "The Evolution and Revolution of the Teaching Machine", Journal of the American Society of Training Directors", (1960), Part 1, and (1961), Part 2.

LEVINE, STANLEY, L., and KNIGHT, WILLIAM J. "Teaching Machines for General and Special Purposes", API, (1962), pp.277-280.

LEWIS, B. N. "Automated group instruction", Goldsmith M., Mechanisation in the classroom Souvenir, (1963). pp.123-129.

LEWIS, P., "Teaching Machines have the Beat", Mus. Educators J., 49, (1962), pp. 94+.

LIGHTENBERGER, W. W. *Plato 2: A Multiple-Student, Computer-Controlled Teaching Device*, Conference on Application of Digital Computers to Automated Instruction, Washington, (1961).

LITTLE, JAMES KENNETH, "Results of Use of Machines for Testing and for Drill upon Learning in Educational Psychology", *Journal of Experimental Education*, 3, (1934), TM&PI 59-65.

LONGRIDGE, AUDREY, "An Application of a teaching machine in speech correction of children with articulation disorders presented at Allerton Park Conference on Automation", *Special Education*, (1960).

LUCE, GAY, GAER, "Can Machines replace teachers?", *Saturday Evening Post*, (1960).

LUMSDAINE, ARTHUR, A. "Audio-visual research in the US Air Force", *AV Communication Review*, 1 (1953), pp.76-90.

LUMSDAINE, ARTHUR A., "Design of training aids and devices", Folley, J. D. Jr. (ed.), *Human Factors Methods for systems design*, American Institute for Research, Pittsburgh, (1960)., TMPI 651.

LUMSDAINE, ARTHUR A., "The Development of teaching machines and programmed self-instruction", *New Teaching Aids for the American Classroom*, (1960), pp.136-173.

LUMSDAINE, ARTHUR A., Memorandum to teaching machine manufacturers. Prospective manufacturers and publishers or potential publishers of programmed text materials, Uni. of Calif. Los Angeles, (1961).

LUMSDAINE, A. A. "Teaching Machines: An Introductory Overview", *Teaching Machines and Programmed learning*, eds. A.A. Lumsdaine and R.Glaser. (1960), pp.5-22.

LUMSDAINE, ARTHUR A., "Teaching Machines and auto-instructional programs", *Educational Leadership*, 18, (1961), pp.271-7+.

LUMSDAINE, ARTHUR A., *Teaching Machines and programmed individual instruction*, Meeting of American Psychological Assn., Chicago (1960).

LUMSDAINE, A.A., *Teaching Machines and programmed learning*, A.A.Lumsdaine and R. Glaser eds., Dept. of Audio-visual Instruction, (1960).

LUMSDAINE, ARTHUR A., "Teaching machines and self-instructional materials", *The Education Digest*, 25, (1959), pp.1-4.

LUMSDAINE, ARTHUR A., "Use of Self-instructional devices", Folley, J.D. (ed)., Human factors methods for system design, American institute for Research, Pittsburgh (1960), pp.291-326.

LUMSDAINE, ARTHUR A., BUTLER, F. C., and MEEK, C. F., "A Prototype magazine leading sound film viewer Staff Memorandum", *AFPTRC*, (1958).

LUXTON, D. H. and CORRIGAN, R. E., *An Example of a Teaching-Machine Program*, Pasadena, Calif: Basic Skill Films.

LYSAUGHT, JEROME D., *A case study of teaching machine Adaptation* , Genesee Valley School Study Council, Rochester, (1960).

LYSAUGHT, J. J. "Programmed Learning and the Classroom Teacher", *N.Y. State Ed.*, 48, (1961), pp.9-11+.

LYSAUGHT, JEROME P. *Teaching Machines and Programming* , Industrial Training Depts. of Eastman Kodak Co. Rochester, (1960).

MC CLELLAN, JAMES, "Automated Education: A Philosophical Approach", *Articles on Programmed Instruction*, pp.28.

MC KOWN H. C., and ROBERTS, A. B., *AV Aids to Instruction*, McGraw Hill, (1949).

MANN, A. P. "Teaching Machines", *Mathematical Teaching*, 24 (1963), pp.143-146.

MARGULIES, STUART, "The Industrial use of Teaching Machines", *Journal of the American Society of Training Directors*, 15, (1961), pp.11-16.

MARKIE, SUSAN MEYER PhD., "Inside the Teaching Machine", *Saturday Review*, (1961), pp.2.

MARKLE, SUSAN MEYER, "Teaching Machines versus Programmers", *AV Communication Review*, 10, (1962), pp.286-292.

MATHIEU, G., "Automated Lang. Instruction ; A New Deal for Student and Teacher", *Automated Teaching Bulletin*, 1, (1959), pp.5-9.

MAYER, SYLVIA, R., *A Method for studying aspects of job design and training requipments of operators in computerised air defense systems*", Technical memorandum Operational applications Lab. Air Force, Cambridge Research Center, Bedford, Mass., (1959), (OAL-TM-59-1).

MAYER, SYLVIA R., *Some problems in the use of a teaching machine for Air Force On-the-job training* , Meeting of the American Psychological Assen. in Chicago, (1960).

MAYER, SYLVIA R., "Use of a Teaching Machine for Air Force on-the-job Training in the SAGE System", *Air Force Command and Control Development Division, Report No. AFCCDD-TN-60-51*, (1960).

MAYER, SILVIA R., and WESTFIELD R. L., "A Field tryout of a teaching machine for training in SAGE operations", *Technical Memorandum, Operational Applications Laboratory*, (1958), TMPI 658.

MAYHEW, D. J. and JOHNSON, A. F. "Teaching Machines", *Journal of Engineering Education*, 50,(1959), pp.51-52. TMPI pp.422-424.

MEIERHENRY, W. C. (ed.), Learning Theory and AV Utilization", *AV Communication Review*, 9, (1961), suppl.4.

MERTENS, J., "De Keystone Overhead Projector. Een eenvoudig en veelzijdig Pedagogisch Hulpmiddel", *Vorming*, 2, (1961), pp.289-293.

MIALARET, G., and MALANDAIN C., "La perception due film fixe chez l'enfant", *Etudes de Linguistique Applique* 1, (1962), pp. 95-103.

MORGAN, DENIS, "Introducing a Teaching Machine", *Special Education* , (1964), pp.15-18.

MORGAN, D. "Language Films", *Year Book of Education*, (1960), pp.492-496.

MORLEY, F. P. "A Teaching-learning device for mechanical drawing", *Industrial Arts and Vocational Education*, 41, (1952), pp.233-234.

MORRILL, C. S., "Teaching Machines: A Review", *Psychological Bulletin*, 58, (1961), pp.363-75.

MORTON, F. RAND, "Initial Mechanico-electronic specifications for a prototype a-v teaching machine designed for self-instructional use in the A-L Learning of FLs", *Publications of the Lang. Lab.*, 3, (1959).

MORTON, F. RAND, "The Lang. Lab. as a Teaching Machine", *International Journal of American Linguistics*, (1960), pp.113-166, also in *Publications of the Lang. Lab., Series Reprints and Preprints*, 1, (1960).

MORTON, F. RAND, "Lang. Lab. Teaching Machines", *Die Neureren Sprachen*, 29, (1960), pp.387-388.

MORTON, F. RAND, "The Teaching Machine and the Teaching of Languages: A report on tomorrow", *PMLA*, 75, (1960), pp.1-6.

MUELLER, THEODORE, "Foreign Lang. Learning andthe Teaching Machine", *The Clearing House*, 40, (1966), pp.345-352.

MURDOCK, ARTHUR, C., "Let's try a learning machine", *Science Teacher*, 28, (1961), pp.40-41.

NANAS, ed. "There's a teaching machine in your future", *Electronics Illustrated*, (1961).

NELSON, C. W., *The Multiple Purpose Self-trainer* , Management Research Associated, Park Forest, Ill., (1954).

NEWMAN, FRED. M. "Teaching Machines: A Primer", *Educational Screen and AV Guide*, 40, (1961), pp.25-27.

O'BRIEN, J. F. "The teacher and the machine, editor's comments", *Educational Magazine*, 21, (1964),

OHLES, JOHN F., "Approach to machine teaching", *School and Society*, 88, (1960), pp.440-441.

OLANDER, C. "A Model for visualising the formula for the area of circle", *Mathematics Teacher*, 48, (1955), pp.245-246.

OLDS, ROBERT, "Automated Education", *Ohio Schools*, (1960), pp.8-9.

PACKER, DR. R. R. "Education machines - a Trend toward Automated Teaching", *Industrial Research*, (1961).

PALOMO, J. R. "A desirable Technique for the use of Sound Films in the Teaching of FLs", *Modern Language Journal*, (1940), pp.282-288.

PALOMO, J. R. "The Sound Film: A Challenge to Lang. Teachers", *Educational Screen*, (1941), pp.106-126.

PASK, G., "Adaptive teaching with adaptive machines", (1960), TMPI 349-366.

PASK, G., "Automatic Teaching Techniques", *British Communications and Electronics*, 4, (1957), pp.210-211. TMPI 668.

PASK, G., "Electronic keyboard teaching machines", *Education and Commerce*, 24, (1958), pp.16-26.

PASK, G. "Report on Symposium papers at Conference on Automata held in Tedingham, England", *Automation Progress*, 4, (1957),

PASK, G. "The self-organising teacher", *Automated Teaching Bulletin*, 1, (1959), pp.13-18.

PASK, G. "The Teaching Machine", *The Overseas Engineer*, 32, (1959), TMPI 670-671.

PASK, G., "Teaching Machines", *Solarton Electronic Group - paper mimeo*, (1958), TM 669-670.

PASK, G. "A Teaching machine for radar training", *Automation Progress*, 2, (1957), 214ff, TMPI 669.

PASK, G., "Tomorrow's Control systems can learn from experience", *Automation Progress*, 4, (1959), pp.44-45, 57.

PERLIS, A. J. "The Uses of the Digital Computer in a Freshman Program", Conference on Application of Digital Computers to Automated Instruction, Washington, D.C. (1961).

PETERSON, J. "The Value of Guidance in Reading for Information", *Teaching Machines and Programmed Learning*, eds. A.A. Lumsdaine and R. Glaser. (1960), pp.52-58.

PETERSON, J. C. "A New Device for Teaching, Testing and Research in Learning", *Transactions of the Kansas Academy of Science*,33, (1930), pp.41-47.

PHILLIPS, DR. ELIAS H., "An approaisal of the Teaching Machine", *Bulletin of the Pennsylvania State School Directors Association*, 25, (1961), pp.32-35

PIMSLEUR, P. "Machines and the Teaching of Foreign Languages", *Year Book of Education*, (1960), pp.482-491.

PORTER, D. "A Report on Instructional Devices in Foreign Lang. Teaching", *Teaching Machines and Programmed Learning*, eds. A.A. Lumsdaine and R. Glaser, (1960), pp.186-205.

PORTER, D., "A Report on instructional devices in FL Teaching", *International Training and Research Program of the Ford Foundation* (1958).

PORTER, DOUGLAS, "A Critical Review of a Portion of the Literature on Teaching Devices", *Harvard Educational Review*, 27, (1957), pp.126-147.

PORTER, DOUGLAS, *A Report on the use of AV Aids in FL Instruction*, read to the fund for the Advancement of Education (1958).

PORTER, DOUGLAS, "Some effects of year long teaching machine instruction", Galanter, pp.85-90. TMPI 673-4.

PORTER, DOUGLAS, "Teaching Machines", Harvard Graduate School of Education Association Bulletin, 3, (1958), pp.1-5.

PRESSEY, S., "Basic Unresolved Teaching Machine Problems", Theory into Practice, 1, (1962),.

PRICE, GEORGE R., "The Teaching Machine", Think, 25, (1959), pp.10-14.

QUACKENBUSH, JACK, "How effective are the new Auto-instructional Materials and devices?", Ire Transactions on Education, 4, (1961), pp.144-151.

RADCLIFFE, S. "Teaching Machines and Programmed instruction", An annotated bibliography, Av. Instr., 8, (1963), pp.104-6.

RADFORD, W. C. "Teaching Machines", S.A. Teach J., Pt. 1-11 (1961), pp.14-16, Pt. 2-12 (1962), pp.32-33, Pt. 3-12, (1962), pp.30-33.

RADIC, LEONARD, "Teaching by Machine", The Age, (1964), 13abcd.

RAMO, SIMON, The impact of advancing technology on methods in education, Paper read at annual convention of American Psychological Asscn., Cincinnati (1959), TMPI 676.

RAMO S.,"A New Technique of Education", Teaching Machines and Programmed Learning, eds., A.A. Lumsdaine and R. Glaser, (1960). pp.367-81.

RATH, GUSTAVE J., ANDERSON, NANCY S., and BRAINERD R.,"The IBM Research Center Teaching Machine Project", Galanter, pp.117-130.

RAYMOND R. C. The Need for Labor-saving Machinery in Education rp of speech", Technical Military Planning Operation General Electric Co. Santa Barbara, (1957).

RECHTER, B.,"Machines that Teach", Teach. J. 45, (1962), pp.71-2.

REED, PAUL C. "Machines for your future?", Educational Screen and AV Guide, 38, (1959), 636.

REID, R. L. "Teaching Machines", Visual Education, (1961).

REHAGE, K. J. "Teaching Machines: Predictions", El. Sch. J., 63, (1963), pp.188.

RENNER, INC. Inexpensive Missile Teaching, a new approach read at the US. Navy guided missile training symposium, Naval Ordnance Lab., Whiteoak, Md. (1958).

RICE, STANLEY, Aspects of teaching machines in relation to educational publishing, American Institute of Graphic Arts, N.Y. (1960).

RICHARDSON, G., "Visual Aids and Lang. Teaching", Modern Languages, 34, (1957), pp.102-106,

RICHMOND, W. KENNETH. "Teachers and Machines", A Survey of Programmed Learning, (1965). pp.272.

RICHMOND, W. KENNETH, "Teaching by Machine: British Indifference Criticise", Times Educational Supplement, 2385 (1961), pp.199.

RICHMOND, W. KENNETH, "Wanted: More Miracles. Teaching Machine Challenges", Times Educational Supplement, 2424 (1961), p.609.

RIVENC, PAUL, "Formation technique de corps enseignant devant utiliser les techniques audio-visuelles", International A-V Technical Centre, Col. 63/VD/ 5/5, 11 pages.

ROBINSON, C. "Teaching Machines", J. Bsns. Ed., 37, (1962), pp.158-9, 204-5.

ROBINSON D. W. "But this machine cannot do", California Teachers' Asscn. Journal, 56, (1960), pp.16-17.

ROCKLYN E. H. and MOREN R. I. "A feasibility study of a special machine-taught oral-aurel Russian Language Course", American Psychologist, 15, (1960), pp.424.

ROPNACK, WERNER, "Das Magnetongerat als Unterrichtungs - und Bildungsmittel, Frn, Westphal, Verlag-Wolfshagen-scharbeuts, (1953), pp.83.

ROSHAL, S. M. "The Instructional Film", Finch, G. (ed.) Symposium on Education and Training Media, National Academy of Science, National Research Council, (1960).

ROSS, WILBUR L., Jr., "Teaching Machines: Industry survey and buyer's guide Center for PI NY (1962).

ROSSELOT, LA VELLE, "Audio-visual techniques in FL Teaching", Modern Lang. Journal, (1949), pp.544-550.

ROSSELOT, LAVELLE, "The U se of Visual Materials in the Teaching of French", Language Teaching Today USA, 26, (1960), pp.187-198.

ROTHKOPF, ERNST Z., "Automated teaching devices and a comparison of two variations of the method of adjusted learning", Psychological Reports, 8, (1961), pp.163-169.

ROTHMAN, PHILIP, "Pushbutton pedagogy", Antioch Notes, 38, (1960), p.3., Col & Univ. 36, (1961), pp.374-8.

RUARK, HENRY C. Jr., "Auto-Instructional Devices alias teaching Machines", The Oregon Education Asscn. Journal, (1961), pp.15-18.

RUARK, HENRY C., "Technology and education", Phi Delta Kappan, (1961), pp.397-392.

SAKODA, JAMES M., and WILEY, CLARENCE F., "An IBM Card Punchboard", Psychological Reports, 8, (1961), 20.

SALTZMAN, IRVINE J. "Comments on Teaching Machines", Oinas F.J. (ed.), Language Teaching Today, (1960), TMPI 678.

SAMPSON, JAMES J., "Questions and answers on teaching machines", Mid-Hudson Channel, 10, (1961), pp.15-16.

SANCHEZ, JOSE, "Audio-Visual Aids. A Frequent Feature", *MLJ*, 44, (1960), p.136, 325, 359.

SANCHEZ, JOSE, "Linguafilms, An Appeal and a Proposal", *MLJ*, (1950,pp.544-552.

SCHAUGHENCY, M. D. "Teaching Arithmetic with calculators", *Arithmetic Teacher*, 2, (1955), pp.21-22.

SCHEFFIER, I., , "Why we need Teaching Machines", *Harvard Ed. R.*, 31, (1961), pp.377-98., (B.F. Skinner), 32, (1962), pp.210-13.

SCHURE, ALEX., "A Case for Automatic Teaching Equipment", *Technical Education News*, (1959).

SCHURE, ALEX. *An Automated Teaching System, a Teaching Machine and Programmed Learning*, New York: Institute for Educational Improvement (1961).

SECHREST L., and STROWIG, R. W., "Teaching Machines and the Individual Learner", *Bibliog. Ed. Theory*, 12, (1962). pp.157-69.

SEDELOW, SALLY Y., "Some Parameters for Computational Stylistics: Computer aids to the use of Traditional Categories in stylistic analysis", *Proceedings of the Literary Data Processing Conference*, (1964), pp.211-229.

SELIGMAN, DANIEL, "Professor Skinner's teaching Machine", *Fortune*, (1958).

SERENY, ANDRE, "Les auxiliaires audio-visuels dans l'enseignement des langues en Hongrie", *International A-V Technical Centre*, 63/WD/ 5/16,11 pages.

SHAFER, SUSANNE M., "Teaching Machines and the Social Studies", *Social Education*, 25, (1961), pp. 85-6.

SHAFFER, H. B., "Teaching by Machine", Bibliog. f pa., *Editorial Res. Reports*, (1961).

SHEPHARD, A. H. and D. LEWIS, "A New Device for Presenting Paired-Associates in Verbal Learning", *American Journal of Psychology*, 63-600-606, (1950).

SILBERMAN, H. F. "A Computer-controlled Teaching Machine", (Technical Memorandum TM-532), System Development Corp.Santa Monica, Calif., (1960).

SILBERMAN, HARRY, F., "Introductory Description of Testing Machines", (Physical characteristics), Read at Symposium on automated teaching, Western Psychological Assen. Convention, San Diego, Calif. (1959), TMPI 680.
SILBERMAN, HARRY F., Self Teaching devices and programmed materials, Santa Monica, California", *Bibliog R.Ed. Res.* 32, (1962), pp.179-93, (1962), pp.20.

SILBERMAN, H. F. "Self-teaching devices and programmed materials: Comparisons with Conventional Instruction", *R. Ed. Res.*, 32, (1962), pp.185-6.

SILBERMAN, HARRY F., "Teaching Machines", *Jun.Col. J.*, 31, (1961), pp.318-20.

SILBERMAN, HARRY F., and COULSON J., "A Draft summary of findings in an exploratory teaching machine study", *Automated Teaching Bulletin*, 1,(1959), pp.35-37.

SILVERMAN, R. E., "Auto-Instructional Devices", Bibliog. f. J. Higher Ed., 31, (1960), pp.481-6.

SILVERMAN, R. E., "Study plan for project 0-4202", Presentation of information on teaching machines, Human Engineering Contract N61339-507 US Naval Training Devices Center (1959).

SILVERMAN, R., The Use of Context Cues in Teaching Machines , Port Washington, N.Y.: U.S. Naval Training Devices Center, (1960).

SILVERMAN, R. E., The Use of context cues in Machine Technical Memorandum Tm - 532", System Devpt Corp. Santa Monica, Calif. (1960).

SILVERMAN, R. E., and ALTER, MILLICENT, "Note on the response in teaching machines programs", Psychological Reports, 7, (1960), p.496.

SILVERMAN, R., and ALTER, MILLICENT, "Response mode, pacing, and motivational effects in teaching machines", Navtradevcen Technical Report 507-3., (1961).

SILVERN, LEONARD C., "An analysis of the teaching machine field and implications for home study courses", The Home Study Review, (1961).

SILVERN, LEONARD C., Are we ready for teaching machine curriculums yes!, Hughes Aircraft Co., Cilver City, Calif. 5, 1.2

SILVERN, LEONARD, C., "A Component-type General Purpose teaching machine of optimum capability for curriculum development", Human Factors, (1961).

SILVERN, LEONARD C., General and special purpose teaching machines for maintenance training (1955-1965). Read at 2nd National Symposium on Human Factors in Electronics IRE May 1961, Hughes Aircraft Co.

SILVERN, LEONARE C. "Implications of the teaching machine for fire service training", Fire Engineering, (1961).

SILVERN, LEONARD C., "The Influence of Teaching Machine Technology on Systems Maintenance Training", Transactions on Human Factors in Electronics, (1961).

SILVERN, LEONARD G., "The Influence of teaching machine technology on electronic system maintenance training", API, (1962), pp. 253-276.

SILVERN, LEONARD C., "Now the teaching machine", Vectors, 3, (1961), p.1-5.

SILVERN, LEONARD C., "Principles and techniques for training programmers, Hughes Aircraft Co. (1961).

SILVERN, LEONARD C., "The teaching machine for employee development", Personnel Journal, 39, (1961), pp.413-417.

SILVERN, LEONARD C., "Teaching machines - automation in education informal presentation to San Fernando Valley State College, (1961).

SILVERN, LEONARE C., "Teaching Machine Systems and the Market Place", PIP, (1963).

SILVERN LEONARD C., "Uniformity in teaching machine technology", AID, (1961).

SINNOTT, W. R., "Teaching Machines", Technical Education, 3, (1961), pp.20-22.

SKINNER, HALCYON, "Improvement in Apparatus for Teaching Spelling, U.S. Patent Office, Washington (1866).

SMITH, DONALD E. P. "Teaching Machines", Michigan Educational Journal, 37, (1960), p.461.

SORENSON, A. G., "The Use of Teaching Machines in developing an Alternative to the concept of intelligence", Educational and Psychological Measurement, 23, (1963), p.323.

SPEER, G. S., "Using mechanical devices can increase speed of reading", The Nation's Schools, 48, (1951), pp.45-48.

STAKE, R. E. "Teaching Machines: Tool of the future or passing fa ncy", Phi Delta Kappan, 44, (1963), pp.247-249.

STANDLEE, L. S.; POPHAM, W. J., and FATTU, N. A., "A Review of troubleshooting research", Research Report 3, Psychological Sciences Division, Office of Naval Research by the IER Indiana Uni. (1956).

STEIN, JAY, W., "Machines that teach better than books", College and Research Libraries, (1961).

STEIN, JAY W., "Multiple choice on teaching machines", Overview, 1, (1960), pp.74-76.

STOLUROW, LAWRENCE M., "Automation in special education", Exceptional Children, 27, (1960), pp.78-83.

STOLUROW, LAWRENCE M., "Implications of current research and future trends", Bibliog. J. Ed. Res., 55, (1962), pp.519-27.

STOLUROW, L. M., "Let's be informed on PI", Phi Delta Kappan, 44, (1963), pp.255-257.

STOLUROW, L. M., "Socratic Teaching: J.A. Jordan jr., reply L.J. Stolurow and K.R. Pahel", Harvard Ed. R., 33, (1963), pp.383-5.

STOLUROW, LAWRENCE M., "Teaching by Machine", Cooperative Research Monograph No. 6, (1961), 170 pages.

STOLUROW, LAWRENCE, M. "Teaching Machines and PI", The American Behavioral Scientist, 6, (1962), 3.

STOLUROW, LAWRENCE M., "Teaching Machines and Special Education", Educational and Psychological Measurement, 20, (1960), pp.429-448.

STOLUROW, LAWRENCE M., and WEST, LEONARD J., "Teaching Machines and Self-instructional programming", The Delta PI Epsilon Journal, 3, (1961), pp.1-27.

STOLUROW, LAWRENCE M., "Teaching with Machines", 99th Annual Convention of the Missouri State Teachers' Assen., St. Louis, (1961).

STURWOLD, VIRGINIA, G., "Sources of self-instructional devices", Audio Visual Instruction, (1961).

SUMNER, WILLIAM LESLIE, "Visual Methods in Education", *B. Oxf.* (1949),

SWANSON, R. A.; LUMSDAINE, ARTHUR A., and AUKES, L. E., "Two studies in evaluation of maintenance training devices", Symposium on Air Force Human Engineering, ed. Finch G., and F. Cameron), 455 1956), pp.267-275.

TANNER, DANIEL, "The Machine Teacher and the Human Learner", *Programs teachers and Machines*, (De Grazia Alfred, Sohn, David A.), (1964), pp.300-309.

TILLEY, K., *Introducing self-tutoring devices'*, Ergonomics Research Society annual conference, (1962).

TONNE, H. A. "Ubiquitous Teaching Machine", *J. Bsns. Ed.*, 26, (1961), pp.192-3.

TOULSON, S., "English at First Sight", Teaching as a foreign language with films and filmstrips", *Visual Education*, (1960), pp.8-10.

TRUMP, J. L. *Images of the Future*, National Assn. of Secondary-School Principals, (1959).

TURNER, RAYMOND, "Deux ex machina", *MLJ.*, 42, (1958), pp. 396-398.

TWYFORD L. C.; O'HARA, J. C.; and GOLDMAN, A., *Green Light Rater"*, Port Washington, NY. US Naval training device center (1958), p.5. TMPI 688.

TYLER, F. T., "Teaching Machines, programs and research on learning," *Bibliog. Sch. R.*, 71, (1963), pp.123-50.

UTTAL, W. R., *The IBM Research Computer Teaching Machine: An Application of the Principle of Conversational Interaction* , Conference on Application of Digital Computers to Automated Instruction, Washington, (1961).

VAN VALKENBERG, NOOGER & NEVILLE INC., *Trouble Shooting Trainer Tester* , (1954).

VAN MEERTEN A., "De Film in Dienst van het Onderwijs in de Moderne Talen", *Toonbeeld*, (1961), pp.20-22.

VANNES, G., "De audio-visuele Middelen te St.Cloud", *Taalonderwijs*, 5, (1961), pp.97-100.

VAN SANDWIJK, H. J., "De Geluidsfilm in Dienst van het Onderwijs in de Franse Taal", *Onderwijs en Opvoeding*, (1961), pp.101-109.

VISSER, "Over visuele en auditieve Leermiddelen voor Engels", *Levende Talen*, 178, (1955), pp.70-72.

VITELES, M. S. "Psychological Principles in the design and operation of synthetic trainers", *Memorandum 19, Project N-105*, (1945).

WACHNER, CLARENCE, "Emphasis on cultural contact and conversational Fluency: audio-visual Instruction", *Bul. Dept. Health, Education and Welfare? Office of Education*, No.16, pp.75-78.

WALLER, THEODORE, "Teaching Machines and school libraries", *Library Journal*, (1961).

WEIMER, PAUL, "A Proposed 'Automatic' Teaching device", Institute of Radio Engineers Transactions on Education, E-1, (1958), pp.51-53.

WEIR, RUTH HIRSCH (NEE HIRSCH), Audio-visual aids in lang. teaching with critical bibliography monograph series on languages and linguistics", No.5, Georgetown Uni, Washington, (1954), pp.89.

WEIR, (NEE HIRSCH, RUTH), "Mechanical Aids in Lang. Teaching", Georgetown University, Institute of Langs. and Linguistics.

WEIR, RUTH HIRSCH (NEE HIRSCH), "Report of the Sixth Annual Round Table Meeting on Linguistics and Lang. Teaching", Georgetown Uni. Press, Wash. (1955).

WEISENBERG, CHARLES M., "Teaching Machines", The Commonweal, (1961).

WEST, L. "Teaching Machines: New Classroom aids", Southern Illinois Business Journal, (1960).

WEST, MICHAEL PHILIP, "Catenizing", English Lang. Teaching, (1951).

WIGREN, HAROLD, E., "Media for tomorrow's schools", Educational Leadership, (1960), pp.495-502.

WILLEY, CLARENCE F., "A Competion item teaching machine for routine classroom use", Psychological Reports, 6, (1960), pp.89-90.

WILLEY, C. "Classroom scoring of tests", Psychological Reports, 4, (1958), pp.611-617.

WILLEY, CLARENCE F., IBM Punchboard construction item self-teaching , Read at APA Meeting (1961).

WILLEY, CLARENCE F., IBM Punchboard response coding , Vermont Psychological asscn. Annual Meeting, Windham College, (1961).

WILSON, V., Some behavioral invariances of machine teaching (mimeo) , General Atronics Corp., Bala Cynwyd, (1959).

WINEBRENNER, D. K. "Automation and education", School Arts, (1957).

WINEBRENNER, D. K. "Launderettes and learn-o-mats.", Sch. Arts, 60, (1961), pp.52.

WITHEROW, MARY, "Recapture those training capsules", Business Education World, 43, (1963), pp.17, 35.

WITTICH, WALTER A., "New Key to Learning: the Mechanized tutor", College and University Business, (1961).

WITTICH, WALTER A., "Teaching Machines: Practical and Probable", The Nations' Schools, 66, (1960), pp.64-5+.

WOLFE, D., "The use and design of synthetic trainers for military training", Applied Psychology panel OSRD, (1946), rep. 5426.

WULFF, J. J. "Specifications for a paired-associate trainer", Maintenance Lab AFPTRC, Lowry Air Force Base, Colo (1957).

YOUNG, LEWIS, H., "The coming boom in teaching machines", The Home Study Review, (1960).

ZACHERT, V., "A Field Test of Instruction by Teaching Machines", Annual Convention of the American Psychological Asscn., New York, (1961).

ZEAMAN, DAVID, "Comments on the automation of Teaching", Symposium on automation of teaching APA Convention, Washington (1958), TMPI 689.

ZEAMAN, DAVID, "Skinner's theory of teaching machines", *Galanter*, (1959), pp.167-176.

ZEAMAN, DAVID, "Teaching Machines", *Grade Teacher*, 78, (1960), pp.39+.

ZELDNER, M., "Education by machines, languages by electronics", *H.Points*, 42, (1960), pp.15-22, Same cond. *Ed. Digest*, 26, (1960), pp.23-5.

ZSCHOKKE, T. L. "Mr. Brain helps in classroom", *California Teachers Asscn. Journal*, 56, (1960), p.13.

ZUCKERMAN, CARL, "Study plan for research in the automation of teaching", US Naval training devices center, Human Engineering Contract N61339-661, (1959).

PSYCHOLOGY OF LANGUAGE & LANGUAGE LEARNING

"Teaching Reading in the Secondary School", Curriculum and Materials, 10, (1955), p.5.,

"Troisieme Conference des Ministres Responsables des Problemes de l'Education, Rome (1962), Resolution No. 2, International A-V Stechnical Centre, Col 63/WD 5/5 annexe.

Unicorn, Vol. 1. (1962), No. 1-3 ceased public editor, Bell, Harry.

United Nations Educational, Scientific and Cultural Organisation, The Use of Vernacular Languages in Education, Monographs on Fundamental Education, 8, pp.156.

ANDERSSON, THECDORE, "An FL Blueprint in Focus", MLJ., (1962), pp.116-117.

ASHER, JAMES J., "Evidence for 'Genuine' One-Trial Learning", International Review of Applied Linguistics, 1, (1963), pp.98-103.

ASHER, JAMES J., "The Learning Strategy of the Total Physical Response: A Review", MLJ, 50, (1966), pp.79-84.

ASHER, JAMES J., "Sensory Interrelationships in the Automated Teaching of Foreign Languages", (1960).

ASHER, J. J. "Sensory interrelationships in the automated teaching of FLs", Percept. Mot. Skills, 14, (1962), pp.38.

AUSUBEL, DAVID P., "Adults versus children in Second-Language Learning: Psychological Considerations", MLJ, 48, (1964), pp.420-424.

BAGIEY, W. C. "The Apperception of the Spoken Sentence", American Journal of Psychology, 12, (1900), pp.80-130.

BAYLEY, NANCY, "On the Growth of Intelligence", American Psychologist, 10, (1955).

BAYLEY, NANCY, "Some increasing Parent-child similarities during the growth of children", Journal of Educational Psychology, 45, (1954).

BELL, H. M. "Rest Pauses in Motor Learning", Psychology Monographs, 54, (1942), p.1.

BERNARD, WALTER, "Psychological principles of language learning and the bilingual reading method", MLJ, 35, (1951), pp.87-96.

BLICKENSTAFF, CHANNING B., "Musical Talents and Foreign Lang. Learning Ability", MLJ, 47, (1963), pp.359-363.

BOLINGER, DWIGHT L., "Binomials and Pitch Accent", Lingua, 2, (1962), pp.34-44.

BOUSFIELD, WESTON A., "The occurrence of clustering in the recall of randomly arranged associates", Journal of General Psychology, 49, (1953), pp.229-240.

BOVEE, A. G., "The Relationship between audio and visual thought comprehension in French", Frence Rev., 21, (1948), pp.300-305.

BOWER, G. H. "An association model for response and training variables in paired associate learning", *Psychological Review*, 69, (1962), pp.34-53.

BOWERS, N. D., "Psychological forces influencing curriculum decisions: Automated instruction and teaching machines", *Review of Educational Research*, 33, (1963), pp.271-2.

BRADWAY, KATH. P., "An experimental study of factors associated with Stanford-Binet IQ changes from the preschool to the Junior High School", *Journal of Genetic Psychology*, 90, (1957).

BRADWAY, KATH, P.; THOMPSON, CLARE W.; and CRAVENS, R., "Preschool IQ's after 25 years", *Journal of Educational Psychology*, 49, (1958).

BRADWAY, KATH. P., "Significant IQ changes in 25 years - a follow-up", *Journal of Educational Psychology*, 52, (1961).

BRAULT, GERARD-J., "Comment Doit-on Enseigner le Francais aux Jeunes Franco-Americains?", *Le Canado-Americain*, (1961).

BRAULT, GERARD J., "New England French Vocabulary", *French Review*, (1961), pp.163-175.

BRAULT, GERARD J., "Some Misconceptions about Teaching American Ethnic Children Their Mother Tongue", *MLJ*, 48, (1964), pp.67-71.

BRIONES, I. T., "An experimental comparison of two forms of linguistic learning", *Psychol. Rec.*, 1, (1937), pp.205-214.

BROOKS, NELSON, HOCKETT, CHARLES F., and O'ROURKE, EVERETT, "Language Instruction: Perspective and Prospectus", *Bulletin of the California State Department of Education*, 32, (1963), pp. ix-49.

BROWN CHARLES T., "Studies in Listening Comprehension", *Speech Monographs*, (1959), pp.288-294.

BROWN, G. I., and HODGKINSON, H. L., "A note concerning "an application of recent developments in psychology to the teaching of German", by C.B. Ferster and S.M. Sapon. *Harvard educ.*, 28, (1958), pp.156-157.

BROWN J. S. "Problems presented by the concept of acquired drives", JONES, M. R., *Nebraska Symposium on Motivation*, (1953).

BROWN, ROGER and BELLUGI URSULA, "Three Processes in the Child's Acquisition of Syntax", *New Directions in the Study of Language*, (1964), pp.131-161, *Harvard Educational Review*, 34, (1964), pp.131-151.

BRUNER, J. S. "Inhelder and Piaget's: The Growth of Logical Thinking - a Psychologist's Viewpoint", *British Journal of Psychology*, 50, (1959).

BUCHWALD, A. M. "Extinction after acquisition under different reinforcement combinations", *Journal of Experimental Psychology*, 57, (1959), pp.43-48.

BUGELSKI, B. R., "*The Psychology of Learning*", Holt, NY, (1956).

DEESE, JAMES, "The Psychology of Learning", McGraw Hill, NY, (1952).

CARMICHAEL, LEONARD, "Manual of Child Psychology", Wiley, NY, (1946, 1951), 2ed. (1954).

CARPENTER, FINLAY, "Reinforcement and instruction", read at the American Psychological Asscn. Meeting NY, (1961).

CARROLL, JOHN B., "The Contributions of Psychological Theory and Educational Research to the Teaching of Foreign Languages", *MLJ*, 49, (1965), pp.273-281.

CARROLL, JOHN BISSELL, "Language and Thought. Englewood Cliffs, Prentice-Hall, (1964), GWYNN, STEPHEN (ed.).

CARROLL, JOHN B., "Language and Thought", *Prentice Hall Inc.*, (1964).

CARROLL, JOHN B., "Language Development", *Encyclopedia of Educational Research*, (1960), pp. 744-752.

CARROLL, J. B., "Process and content in psycho-linguistics," In R. Glaser, et al., *Current trends in the description and analysis of behavior*, (1958), pp.175-200.

CARROLL, JOHN B., "Words, Meanings and Concepts", *Harvard Educational Review*, 34, (1964), pp.178-202.

COOPER, FRANKLIN S., "X-Ray sound motion picture film in Arabic, Chinese and Russian", *Dept. of Health, Education & Welfare Office of Education*, OE Contract SAE 8324, (1960).

COOPER, FRANKLIN S., DELATTRE, PIERRE C., LIBERMAN, ALVIN M., BORST, JOHN M., and GERSTMAN, LOUIS J., "Some Experiments on the Perception of Synthetic Speech Sounds", *Journal of the Acoustical Society of Amer.*, 24, (1952), pp.597-606.

CORNFIELD, RUTH R., "The Spoken Word", *Educational Screen and Audio-visual Guide*, 42, (1963), pp.82-87.

CUMMINGS, ALLANA and GOLDSTEIN, LEO, S., "The Effect of Overt and Covert Responding on Two Kinds of Learning Tasks", *Technical Report 620919* Center for PI (1962), rp abridged De Cecco, (1964), pp.231-241.

CURRAN, CHARLES A., "Counseling Skills Adapted to the Learning of Foreign Languages", *Menninger Bulletin*, 25, (1961), pp.78-93.

DAVIES, EVAN, "Some Psychological Characteristics of rapid reading", *Australian Journal of Education*, 6, (1962), No.2.

DEESE, JAMES, "On the structure of associative meaning", *Psychological Review*, 69, (1962), pp.161-175.

DUKER, S., "Listening: A Communication Skill", *Ed Screen AV G*, 42, (1963), pp.136-137.

DYER, H.S., "The effect of recency of traning on the College Board French scores", *Sch. & Soc.*, 70, (1949), pp.105-106.

EISENSON, JON, *"The Psychology of Speech"*, Crofts, NY (1946).

EMESON, D. L., and WULFF, J. J., "The Relationship between "What is Learned" and "How it is Taught", Technical memorandum AFPTRC, Lowry AF Base, ML-TM-57-32 D (1957), TMPI 616-618.

ENGLISH, Dictionary of Psychological & Psycho-analytical Terms Longmans, NY, (1961).

ERICKSEN, S. C. "Variability of attack in massed and distributed practice", Journal of Experimental Psychology, 31, (1942), pp.339-345.

ESBENSEN, THORWALD, "Multiple choice, constructed response: different in effect?", AID, (1961).

ESTARELLAS, JUAN, Applications of Psycholinguistic Theory to Foreign Language Teaching , A paper delivered at the Second Southern Conference on Language Teaching, (1966).

ESTARELLAS, JUAN and REGAN, TIMOTHY F., "A Report on a Research Project to study the effectiveness of Teaching Sounds and Letters simultaneously at the very beginning of a basic foreign lang. course", (1966).

ESTES, W. K. "An experimental study of punishment", Psychological Monograph, 57, (1944), no.263.

ESTES, W. K. "Learning Theory and the New 'Mental Chemistry'", Psychological Review, 67, (1960), pp.207-223.

ESTES, W. K. Modern Learning theory , Appleton Century Crofts, NY, (1954).

ESTES, W. K. "Statistical theory of spontaneous recovery and regression", Psychology Review, 62, (1955), pp.145-154.

ESTES, W. K. "Towards a statistical theory of learning", Psychology Review, 57, (1950), pp.94-107.

ESTES, W. K., and STRAUGHAN J. H. "Analysis of a verbal conditioning situation in terms of statistical learning theory", Journal of Experimental Psychology, 47, (1954), pp.225-234.

ESTES, W. K.; HOPKINS B. L., and CROTHERS, E. J., "All or none and conservation effects in the learning and retention of paired associates", Journal of Experimental Psychology, 60, (1960), pp.329-339.

FELDMAN S. M. and UNDERWOOD, B. J., "Stimulus recall following paired-associate learning", Journal of Experimental Psychology, (1957).

FERSTER, C. B. "Withdrawal of positive reinforcement as punishment", Science, 126, (1957), p.509

FERSTER, CHARLES B., and SAPON, STANLEY M., "An Application of recent developments in Psychology to the Teaching of German", Harvard Educational Review, 28, (1958), TMPI 173-185.

FERSTER, C. B. and SKINNER, B. F., Schedules of reinforcement , Appelton-Century-Crofts, NY, (1957).

FISCHER, HARDI, "Die Messung der Semantischen Bedeutung", Iral, 3, pp. 137-148.

FISHMAN, J.A. 1957 Supplement to College Board Scores, No. 2 New York: College Entrance Examiniation Board, (1957)

FLANAGAN, J. C., "General consideration in the selection of test items and a short Method of estimating the product-moment coefficient from the Data at the Tails of distributions", Journal of Educational Psychology, 30, (1939), pp.674-680.

FLANAGAN, JOHN C., "A proposed procedure for increasing the efficiency of objective tests", J. Ed. Psych., 28, (1937), pp.17-21.

FLAVELL, J. H. "The Developmental Psychology of Jean Piaget Van Nostrand, New Jersey, (1963).

FOLLETTIE, J. F. "Effects of training response mode, test form and measure on acquisition of semi-ordered factual materials", Research memorandum 24, Fort Benning, Ga. (1961).

FORLANO, G. "School learning with various methods of practice and reward", Teach. Coll. Contr. Educ., (1936), No. 688.

FRANCQ, H. G. "L'introduction du francais au jardin d'enfants", The French Review, 39, (1966),

FREEMAN, MARGARET Z., and BUKA, MAGDA, "Language Learning and Frequency Response 2", International Journal of American Linguistics, 28, (1962), pp.62-79.

FRY, E., "Research Tools: Instrumentation in Educational Research", Review of Educational Research, 30, (1960), pp.513-521.

GABRIELLE, sister MARIE, F.S.E., The Relationship between French Silent Reading and the two factors, Mental Ability and English Silent Reading at a fourth grade level for lingual, sex and mental ability groups , Doctoral Dissertation in the Graduate Dept. of theSchool of Education, Fordham Uni. (1964).

GABRIELLE, Sister MARIE, F.S.E., and Sister RAYMOND DE JESUS, F.S.E., "Fles: A Comparative Study", MLJ, 48, (1964), pp.72-76.

GAGNE, ROBERT, M., "The effect of sequence of presentation of similar items on the learning of paired associates", Journal of Experimental Psychology, 40, (1950), pp.61-73.

GAGNE, ROBERT M., "Military training and principles of learning", American Psychologist, 17, (1962), pp.83-91.

GAGNE, ROBERT M., "Training devices and simulators: some research issues", American Psychologist, 9, (1954), pp.95-107.

GAGNE, ROBERT M., and BAKER, K. E., "On the relation between similarity and transfer in the learning of discriminative motor tasks", Psychologist Review, (1950), pp.670-679.

GAGNE, R.M. and BOLLES, R.C., "A Review of Factory in Learning Efficiency", Automatic Teaching: The State of the Art, ed. E.Galanter, (1959), pp.13-53, TMPI 627.

GAGNE, ROBERT M. and FOSTER, H. W. "Transfer to a Mtor Skill from practice on a pictured representation", *Journal of Experimental Psychology*, 39, (1949), pp.342-355.
GALANTER, EUGENE H., "Two Models of a Student", *Teachers College Record*, 62, (1960), pp.187-194.

GARDNER, R. C. and LAMBERT, W.E., "Motivational variables in second-language acquisition", *Canad. J. Psychol.*, 13, (1959), pp.266-272.

NAPI, GARRY, R., *The Psychology of Learning* , (1963), The Centre for Applied Research in Education, Inc., Washington.

GATES, A. I. "Recitation as a factor in memorising", *Archives of Psychology*, 6, (1917), TMPI 629

GESELL, ARNOLD AND OTHERS, *The first Five Years of Life* , Harper, (1940).

GESELL, ARNOLD LUCIUS, and ILG, FRANCES L., *The Child from Five to Ten* , Harper, NY, (1946),

GETZELS, J. W., and JACKSON, P. W. *Creativity and Intelligence* , Wiley, NY, (1962).

GIBSON, E., "Retroactive inhibiton as a function of degree of generalisation between tasks", *Journal of Experimental Psychology*, (1941), pp.93-115.

GIBSON, E. J. "A Systematic application of the concepts of generalisation and differentiation to verbal learning", *Psychologist Review*, (1940), pp.196-299.

GILBERT, A. C. F. "Effect of immediacy of knowledge of correctness of response upon learning", *Journal of Educational Psychology*, 47,(1956), pp.415-422.

GILBERT, THOMAS F., *Some issues involved in selecting an automatic teaching device* , Report to Bell Telephone Labs. (1958).

GLANZER, MURRAY, "Toward a Psychology of Lang. Structure", *Journal of Speech and Hearing Research*, 5, (1962), pp.303-314.

GLASER, ROBERT, *Knowledge of learning and methods of training* , Uni. of Pittsburgh, (1958).

GLASER, ROBERT, "Psychology and Instructional Technology", abridged to "Components of the Instructional Process" De Decco, Robert Glaser, (ed.), *Training Research and Education*, (1962), pp.1-30.

GLASER, ROBERT AND GLANZER, M., "Training and training research", *American Institute for Research*, (1958), TMPI 637.

GOROW, F. F. *Do it yourself statistics* , Long Beach State College, California.

GRAY, WILLIAM S. "Preliminary survey on methods of teaching reading and writing. Part 1", *Education Clearing House*", UNESCO Educational studies and documents , 5, (1953), 56.

GREEN, EDWARD J., "Concept formation, a problem in human operant conditioning", *Journal of Experimental Psychology*, 49, (1955), pp.175-180.

GREEN, EDWARD J., *Error rate and response variability in programmed Instruction* , (1961). MS

GREEN, EDWARD, J. "A Simplified model for stimulus discrimination", *Psychology Review*, 65, (1958), pp.56-63.

GREEN, EDWARD J., "Stimulus variability and operant discrimination in human subject", *American Journal of Psychology*, 69, (1956), pp.269-273.

GREEN, EDWARD J., and MEINING, F., "Rate response probability in discrimination learning", *Science*. 126, (1957), pp.1339-1340.

GREEN, EDWARD J., SANDERS, R. M., and SQUIER, R., "Schedules of reinforcement and discrimination learning", *Journal of Experimental Analytical Behavior*, 2, (1959), pp.293-299.

GREENSPOON, J., and FOREMAN S., "Effect of delay of knowledge of results on learning a motor task", *Journal of Experimental Psychology*, 51, (1956), pp.226-228.

GREENSPOON J., "The reinforcing effects of two spoken words on the frequency of two responses", *American Journal of Psychology*, 68,(1955), pp.409-416.

GRINDER, R.E.; OTOMO, A., and TOYOTA, W., *Comparisons between 2nd, 3rd, and 4th Grade Children in the audio-lingual learning of Japanese as a second language* , Dept. of Psychology, Univ. of Hawaii, (1961).

GRINGS, W.W.; RIGNEY, J. W. ; BOND, N. A., and SUMMERS. S. A. A., *Methodological study of electronics troubleshooting skill 1: Rationale for and description of the multi-alternative symbolic troubleshooting test*", Technical report for personnel and training branch, Psychological Services Div. Office of Naval Research, Dept. of Psychology, Uni. of S.California, (1953).

GUILFORD, "Factorial Angles to Psychology", *Psychological Review*, 68, (1961), pp.1-20.

GUILFORD J. P. "The Gifted Child", *Yearbook of Education*, (1962).

GUILFORD, J. P. "The Structure of Intelligence", *Psychological Bulletin*, 53, (1956).

GUILFORD J. P. "Three Faces of Intellect", JENKINS, J. J. and PATTERSON, D. G., "The Search for Intelligence, Meth. Lond. (1961).

GUILFORD and P.R. MERRIFIELD, *The Structure of Intellect: Its Uses and Implications*, No. 24, Reports from Psychological Lab. Uni. of Southern California, (1960).

GUILDORD, J. P.; KETTNER, N. W., and CHRISTENSEN, P. R., 'A *Factor-analytic investigation of the Factor called general reasoning* , Report from Psychological Lab. No.14 Uni. of S.California (1955).

GUTHRIE, E. R. "Conditioning: A Theory of Learning in terms of Stimulus response association", *The Psychology of Learning*, (1942). pp.17-60.

GUTHRIE, E.R. *The Psychology of learning*, New York, Harper & Bros.(1935).

HALL, ROBERT A., Jr., "The Life Cycle of Pidgin Languages", Lingua, 11, (1962), pp.151-156.

HANCOCK, HILDA, C., "Reading for comprehension", Esprit and Geist, 1 (1958).

HARRISBERG, E. L. "Teaching Kinematics by project synthesis", Journal of Engineering Education, (1958), pp.283-286.

HASLERUD, G. M. and MEYERS, SHIRLEY, "The transfer value of given and individually derived principles", J. Educ. Psychol., 49, (1958), pp.293-298.

HATCH, RICHARD S., "More on the response mode controversy", AID, (1961).

HARTSHORNE, H., and M.H. MAY, Studies in the Nature of Character part 1, Studies in Deceit, The Macmillan Co. NY (1928).

HANSEN, KENNETH HARVEY, High School Teaching, Printice-Hall, (1958).

HAYGOOD, DANIELLE H., "AV Concept formation", Journal of Educational Psychology, 56, (1965), pp.126-132.

HEBB, DONALD, O., The Organisation of Behaviour, Wiley, NY, (1949), 6th printing (1961).

HENRY, NELSON B., National Society for the Study of Education, Committee on Education for the Gifted, (1958).

HIEBSCH, H., Soviet Psychology., - A Symposium, New York: Philosophical Lib.

HIEBSCH, H., Soviet Psychology - A Symposium, Philosophical Lib. NY, (1961).

HILGARD, ERNEST R., Learning theory ad its applications, Institute for Communication Research, Stanford Uni. (1960), pp.19-26.

HILGARD, ERNEST R., Theories of Learning, Appleton-Century-Crofts, NY (1948), 2ed. (1958).

HILGARD, ERNEST R., "What support from the psychology of learning?", Nea Journal, 50, (1961), pp.20-21.

HILGARD, ERNEST R., and MARQUIS, D. G., Conditioning and learning (1940), Appleton Century Crofts (Methuen L), NY, (1961) 2ed. ed. Kimble, Gregory A., pp. ix +590.

HIRSCH, R. S. The effects of learning test results on learning of meaningful material, Pa State Uni, Port Washington NY, Special Devices Center, Office of Naval Research (1952).

HOBAN, C. F., "The usable residue of educational film Research, New Teaching Aids for the American Classroom", Stanford Uni, Calif, The Inst. for Communication Research (1960), pp.95-115.

HOLLAND, JAMES G., Establishing skills through self-instruction, APA Meeting, NY, (1961).

HOLODNAK, H.B. "The effect of positive and negative guidance upon maze learning in children", J.Educ. Psychol., 34, (1943), pp.341-354.

HOROWITZ, A. E., "The effects of variation in linguistic structure on the learning of miniature linguistic systems", Unpublished doctoral dissertation, Harvard Univ. (1955).

HOSMER, CLARK, L. *Payoff in programming of tutoring units* APA Meeting, NY, (1961).

HOUSE, A. S.; K.N. STEVENS; T.T. SANDEL, and J.B. ARNOLD, "On the Learning of Speechlike Vocabularies", *Journal of Verbal Learning and Verbal Behavior*, 1, (1962), pp.133-143.

HOVLAND, C. I. "A Communication analysis of concept learning", *Psychological Review,* 59, (1952), pp.461-472.

HOVLAND, C., "Human Learning and Retention", STEVENS S.S. ed., *Handbook of Experimental Psychology,* (1951).

HOVLAND, C. I. "A Set of flower designs for experiments in concept formation", *American Journal of Psychology*, 66, (1953), pp.140-142.

HUDSON, S., "Intelligence, Divergence and Potential Originality", *Nature*, 196, (1962).

HUDSON, S., "Review of The Search for Intelligence", eds., J.J. Jenkins, and D.G. Patterson, *Nature*, 197, (1963).

HULL, C.L., *A behavior system: an introduction to behavior theory concerning the individual organism,* New Haven, Conn, Yale Univ.Press (1952).

HULL, C. L. *Essentials of behavior*, New Havan, Conn. Yale Univ.Press, (1951).

HULL, C. L. *Hypnosis and suggestibility: An Experimental Approach*, NY, Appleton-Century-Crofts, (1933).

HULL, C.L., *Principles of Behavior*, Appleton-Century-Crofts, Inc. NY., (1943).

HUNT, J. Mc V., *Intelligence and Experience*, Ronald Press Co.NY., (1961), pp.416.

HUSE, HOWARD RUSSELL, *The Psychology of FL Study*, Uni. of N.Carolina Press, Chapel Hill, (1931).

IRION, A. L. "An Investigation of four modes of operation and three types of learning tasks on the improved subject matter trainer", *AFPTRC* Lowry Air Force Base, Colo, (1957).

IRWIN, O. C., Infant Speech: Consontal Sounds, (1947).

ISRAEL, M. L. *Skinnerian Psychology and educational redesign*, Symposium sponsored by American Psychological Asscn. Committee on the Relations between Psychology and Education, Washington (1958).

ISRAEL, M. L. "Variably Blurred Prompting: 1. Methodology and Application to the Analysis of Paired-associate Learning", *Journal of Psychology*, 50, (1960), pp.43-52.

JAMES, N. E., "Personal Preference for Method as a Factor in Learning", *Journal of Educational Psychology*, 53, (1962), pp.43.

JENSEN, ARTHUR, "Learning Ability in Retarded, Average and Gifted Children", Merrill-Palmer Quarterly of Behavior and Development, 9, (1963), pp.124-140.

JENSEN, ARTHUR, R. "Reinforcement, psychology and individual differences", APA Meeting, NY, (1961).

JOHN E. R. and MILLER, J. G. "The acquisition and application of information in the problem-solving process; an electronically operated logical test", Behavioral Science, 2, (1957), pp.291-300.

KAESS, W. and ZEAMAN D. "Positive and negative knowledge of results on a Pressey type punchboard", Journal of Experimental Psychology, 60, (1960), pp.12-17.

KAGAN, J.; SONTAG, L. W.; BAKER, C. T.; and NELSON, VIRGINIA L.; "Personality & IQ Change", Journal of Abnormal and Social Psychology, 56, (1958).

KALE, S. V., and GROSSLIGHT, J. H., Exploratory studies in the use of pictures and sound for teaching foreign language vocabulary, Tech. Rep. SDC 269-7-53, Port Washington, NY., U.S. Navy Special Devices Centre (1955).

KAMMAN. J. F., A comparison of factor patterns in a native language and an auxiliary language. Unpublished doctoral dissertation, Univ. of Illinois,(1953). Microfilm Abstr., 14, (1954), pp.406.

KANNER, JOSEPH H., and SULZER, RICHARD L. "Overt and covert rehearsal of 50% versus 100% material in film learning", SPI, (1961), pp.427-444.

KAYE, E. "Curricular sequence based on psychological processes rather than subject content", Bibliog. Except Child, 27, (1961), pp.425-8+.

KEEHN, J. D. and PROTHRO, E. T. "The meaning of 'Intelligence" to Lebanese Teachers", British Journal of Psychology, 49, (1958).

KELLER, FRED. S. Learning: Reinforcement Theory, Random House, NY, (1954).

KELLY, CHARLES M., "Mental Ability and Personality Factors in Listening", The Quarterly Journal of Speech, 49, (1963), pp.152-156.

KEMP, L. C. D. "Ability and Attainment", Australian Journal of Psychology, 2, (1958).

KESSMAN, M. Experimental comparison of writing-speaking versus speaking-writing sequences in learning paired associates. Unpublished doctoral dissertation, Indiana Univ. (1959).

KETTELKAMP, G. C. "Student achievement in two or more foreign languages as related to order of study", Sch. Rev. 53, (1945), pp.610-614.

KIMBLE, GREGORY A. and WULFF, J. JEPSON,"The effect of response guidance on the value of audience participation in training film instruction.", Air Force Human Factors Operations Research Lab. (1953), TMPI 646-7.

KIMBLE, GREGORY, A. "Hilgard and Marquis' Conditioning and Learning", Appleton Century Crofts, NY, (1961), Methuen, London (1961), pp. ix + 590.

KLINCK, G. A., "Psychology of the direct method", *Canad. Mod. Lang. Rev.*, 14, (1957), pp.10-14.

KOPSTEIN, F. F. and ROSHAL, S. M. "Learning foreign vocabulary from pictures vs. words", *Amer. Psychologist*, 9, (1954), pp.407-408.

KOPSTEIN, FELIX F. and ROCKWAY M. "Self-tutoring and problems in training", Air Force Office of Scientific Research and the Uni. of Pa Conference on the Automated teaching of verbal and symbolic skills, (1958).

KORONAKOS, C., "A Comparison of five methods of teaching basic reading skills to the mentally retarded", Study presented at Allerton Park Conference on Automation in Special Education, (1960).

KOWITZ, GERALD, "Organisational problems encountered in the technology of instruction", Genesee Valley School Study Council, Rochester, Uni. of Rochester, (1960).

KRAWIEC, T. S. "A comparison of learning & retention of materials presented visually and auditorially", *J. Gen. Psychol.*, 34, (1946), pp.179-195.

KRECH, DAVID and CRUTCHFIELD, R. S., *Elements of Psychology*, Alfred A Knopf, Inc. NY, (1958).

LADO, ROBERT, "Memory Span as a factor in second Language Learning", *IRAL*, 3, (1965), pp.123-129.

LAMBERT, WALLACE E. "Psychological Approaches to the Study of Language - Part 1: On Learning, Thinking and Human Abilities",*MLJ*, 47, (1963), pp.51-62.

LAMBERT, WALLACE E. "Psychological Approaches to the Study of Language - Part 2: On Second Language Learning and Bilingualism", *MLJ*, 47, (1963), pp.114-121.

LAMBERT, W. E. and JAKOBOVITS, L. "Verbal satiation and changes in the intensity of meaning", *J. exp. Psychol*., 60, (1960), pp.376-383.

LANE, HARLAN L. "Some Differences between first and second Language Learning!", *Language Learning*, 12, (1962), pp.1-14.

LASSER, S. "The impact of visual aid displays showing a manipulative task", *Quarterly Journal of Experimental Psychology*, 6, (1954), pp.95-106.

LEBEL, C. J. "Standards for Educational Recording Machines", *Quarterly Journal of Speech*, 36, (1950), pp.520-523.

LEHISTE, ILSE and PETERSON, GORDON E. "Linguistic considerations in the study of speech intelligibility", *Journal of the Acoustical Society of America*, 31, (1959), pp.280-286.

LEVINSON, B. M. "Subcultural values and IQ stability", *Journal of Genetical Psychology*, 98, (1961).

LEWIS, D. and SHEPHARD A. H. "A new device for presenting paired associates in verbal learning", *American Journal of Psychology*, 63, (1950), pp.600-606.

LHU, C. W. "The conditions of retention", *Psychological Monograph*, 31, (1922).

LIBERMAN, A. M. "Some results of research on speech perception", *J. Acoust. Soc. Amer.*, 29, (1957), pp.117-123.

LIBERMAN; HARRIS; HOFFMAN; and GRIFFITH, "The discrimination of speech sounds within and across phoneme boundaries", *Journal of Experimental Psychology*, 54, (1957), pp.5.

LICKLIDER, J. C. R. and MILLER, G. A. "The perception of speech", In S.S. Stevens (ed.) *Handbook of experimental Psychology*, (1951), pp.1040-1074.

LISKER, LEIGH; COOPER, FRANKLIN S; LIBERMAN, ALVIN M, "The uses of experiment in language description", *Word*, 18, (1962), p.103.

LITTLE, J. K. "Results of Use of Machines for Testing and for drill upon learning in Educational Psychology", *Journal of Experimental Education*, 3, (1934), pp.45-49.

LIVANT, WILLIAM P. "Productive Grammatical Operations: 1: Noun Compounding of 5-year olds", *Language Learning*, 12, (1962), pp.15-26.

LIVERANT, S. "Intelligence: A Concept of need of re-examination", *Journal of Consultative Psychology*, 24, (1960).

LORGE, I. "Psychological bases for adult learning", *Teachers Coll. Rec.*, 41, (1939), pp.4-12.

LOTZ; ABRAMSON; GERSTMAN; INGEMANN; and NEMSER, "The perception of English stops by speakers of English, Spanish, Hungarian and Thai", *Language and Speech*, 3, (1960), part 2.

LOVELL, K. "A follow-up study of Inhelder's and Piaget's "The Growth of Logical Thinking"", *British Journal of Psychology*, 52, (1961).

LUMSDAINE, ARTHUR A. "Improving the quality of instruction through programmed learning", 26th Annual Conference sponsored by Educational Records Bureau and American Council on Education, (1961).

LUMSDAINE ARTHUR A. "Investigation to determine optimal learning units and optimal presentations for use with automated teaching", *American Institute for Research* , (1960).

LUMSDAINE, ARTHUR A. "New idea for information inputs at the work station", San Francisco College Institute, training by automation industry, (1960).

LUMSDAINE, ARTHUR, A. "Partial and more complete automation of teaching in Group and individual learning situations", *Galanter*, pp.147-166.

LUMSDAINE, ARTHUR, A. "Possibilities and implications of automated teaching methods", Symposium on automation of teaching at *Annual Convention of American Psychological Assen.* (1958).

LUMSDAINE, A. A. "Response Cueing and Size of Step in Automated Learning Programs", Annual Convention of the American Psychological Assen. Cincinnati, (1959).

LUMSDAINE, ARTHUR A. "Some conclusions concerning student response and a science of instruction", SPI, (1961), pp.471-500.

LUMSDAINE, ARTHUR A. and GLADSTONE, A. I., "Overt practice and audio-visual embellishments", Mark A. May and Arthur A. Lumsdaine (eds.), Learning from Film, (1958), pp.58-71.

LUMSDAINE, ARTHUR A., and KLAUS, D. J. "What's in a name? - a problem of terminology", American Institute for Research, Pittsburgh, (1960).

MC CARTHY, DOROTHEA, "Language Development in Children", Carmichael Leonard, Manual of Child Psychology, 2ed (1954), pp.492-630.

MC GEOCH, JOHN ALEXANDER, Psychology of Human Learning, (1942), 2nd ed. rev by Irion, Arthur L., Longmans, NY, (1952).

MCKAY, LLEWELYN R., "Some Pitfalls in teaching Foreign Languages", School and Society, (1960), pp. 2ff.

MACLAY, HOWARD, "Linguistics and Language Behavior", The Journal of Communication, 14, (1964), pp.66-73.

MAC PHERSON, S. J.; DEES, V. and GRINDLEY, G. C., "The effect of knowledge of results on learning and performance", Quarterly Journal Experimental Psychology, (1948/9), pp.68-78, 167-174.

MARCHWARDT, A. H. "An experiment in aural perception", Engl. J., 33, (1944), pp.212-214.

MARCKWARDT, A. H. "Phonemic bifurcation as an English teaching problem", Pap. Mich. Acad. Sci. Arts. Lett., 33, (1947), pp.363-371.

MARCKWARDT, A. H. "Phonemic structure and aural perception", Amer. Speech, 21, (1946), pp.106-111.

MARGOLIUS, G. and MACCOBY, N. "Methods of combining practice with filmed demonstration in teaching complex response sequences", Read at Annual Convention of Americal Psychological Asscn., Chicago, (1956).

MATTHIEU, GUSTAVE, "On the Anatomy of listening Comprehension", French Review, 34, (1961), pp.50-53.

MEREDITH, PATRICK, Learning, Remembering and Knowing, Association Press, (1961), pp.175.

MEYERS, C. D. and FRY, EDWARD B., A Program in Educational Psychology, Teacher Specialist Project, School of Education, Univ. of S.California, (196[illegible]).

MICHAEL, DONALD M. and MACCOBY, NATHAN, "Factors influencing verbal learning from films under conditions of audience participation", Journal of Experimental Psychology, 46, (1953), pp.411-418.

MICHAEL, DONALD, N. and MACCOBY, NATHAN, "Factors influencing the effects of student participation on verbal learning from films, motivating versus practice effects, 'feedback', and overt versus covert responding", SPI, (1961), pp.271-294.

MICHAEL, DONALD N., and MACCOBY, NATHAN, "Some factors influencing the effects of audience participation on learning from a factual film", Memorandum report Human Resources Research Lab. HQ Command, Bolling Air Force Base, Washington (1951)

MIDDLETON, R. G. "Spelling: The relationship of step size to ability and their effects of learning", Educational Review, 16, (1964), pp.99-108

MILHOLLAND, JOHN E., "The value of High School Foreign Language for the Study of College Introductory Foreign Language", MLJ, 47, (1963), pp.235-238.

MILLER, G. A. "Free recall of redundant strings of letters", J. exp. Psychol., 56, (1958), pp.485-491.

MILLER, G.A. and NICELY, PATRICIA A. "An analysis of perceptual confusions among some English consonants", J. Acoust. Soc. Amer., 27, (1955), pp.338-352.

MILLER, N. E. and others, "Graphic communication and the crisis in Education", AV Communication Review, 5, (1957), pp.1-120.

MILLER, R. B. "Handbook on training and training equipment design", WADC Technical Report, (1953), pp.53-336.

MILLER, R. B. Psychological Considerations for the Design of Training Equipment, Wright Air Development Centre, Ohio, (1954).

MILLER, R. P. "A Study of methods for determining conceptual content of technical jobs for training purposes", American Institute for Research, (1955).

MILLER, R. B. "A Suggested guide to functional characteristics of training and training equipment", Technical Memorandum AFPTRC, (1956).

MILLER, R. B. "Task and part-task trainers and training", WADC Technical Report 56-41, (1956).

MILNER, P. M. "Review of W. Penfield & L. Roberts, 'Speech and Brain Mechanisms' and R.K. Overton, 'Thought and Action'", Canad. J. Psychol., 14, (1960), pp.140-143.

MILTON, OHMER, Effective College Learning, Harper & Row, NY, (1964), pp. viii + 88.

MINER, J. B. Intelligence in the United States, Springer, NY, (1957).

MOORE, J. WILLIAM and SMITH, WENDELL I. "A Comparison of Several Types of 'Immediate Reinforcement'", Preliminary Report for AFOSR-61-54, (1962), pp.192-201.

MOORE, WALTER J. "Promising lead from recent research in reading", APA Meeting (1961).

MOORE, O. K. and ANDERSON, S. B. "Modern logic and tasks for experiments in problem solving behavior", Journal of Psychology, 38, (1954), pp.151-160.

MORGAN, B. Q. and OBERDECK, LYDIA, M. "Active and passive vocabulary", In E.W. Bagster-Collins, et al., *Studies in Modern Language Teaching*, 17, (1930), pp.213-221.

MORGAN, C. L. and BONHAM, D. N. "Difficulty of vocabulary learning as affected by parts of Speech", *J. Educ. Psychol*., 35, (1944), pp.369-377.

MORGAN, C. L. and FOLITZ, MARY C. "The effect of context on learning a French vocabulary", *J. Educ. Res*., 38, (1944), pp.213-216.

MORGAN, C. L. and BAILEY, W. L. "The effect of context on learning a vocabulary", *J. Educ. Psychol*., 34, (1943), pp.561-565.

MORTON, F. RAND and LANE, HARLAN L. "Techniques of operant conditioning applied to Second LanguageLearning", Address to International Congress of Applied Psychology, Copenhagen, (1961).

MOWRER, O. H. and JONES, H. M. "Habit strength as a function of the pattern of reinforcement", *Journal of Experimental Psychology,* 35,(1945), pp.293-311.

MOWRY, H. W. and WEBB, W. B. "Facilitation of learning by the Classroom communicator", Ed. H.W. Mowry, W.B. Webb, and E.A. Garvin, Technical Report prepared by Dept. of Psychology, Washington Uni. St. Louis (1955),

MUELLER, T. "Perception in foreign language learning", *Mod. Lang. J*., 42, (1958), pp.167-171.

MUELLER THEODORE and HARRIS ROBERT, "The effect of an audio-lingual program on drop-out rate", *MLJ*, 50, (1966), pp.133-137.

NEWMAN, SLATER E. "A Mediation Model for Paired-Associate Learning", *De Cecco*, (1964), pp.172-186.

NICHOLS, RALPH G. and STEVENS, LEONARD A. "Listening to People", *Harvard Business Review*, 35, (1957), pp.85-92.

NOBLE, C. E. "An analysis of meaning", *Psychol. Rev*., 59, (1952), pp.421-430.

NOBLE C. E. and McNEELY, D. A. "The role of meaningfulness (m) in paired-associate verbal learning", *J. Exp. Psychol*, 53, (1957), pp.16-22.

NOLL, VICTOR H. "Introduction to Educational Measurement", Houghton Mifflin, Boston (1957).

NOSTRAND HOWARD LEE and others, "Introduction: Sources, scope and Structure", *Research on Language Teaching; An Annotated International Bibliography for 1945-64*, 1, (1965), pp. xiii-xxi, 373.

NOWLISS, VINCENT M., "The Motivational aspects of automated teaching", Presented before Genesee Valley School Study Council, Rochester (1961).

O'CONNOR V., "An examination of instructional films for characteristics of an effective teaching presentation", *Harvard Educational Review*, 20, (1950), pp.271-284.

OJOMANN, R. H. and WILKINSON, F. R. "The effect on pupil growth of an increase in teachers understanding of pupil behavior", Journal of Experimental Education, 8, (1939), pp.143-147.

ORBISON, W. D. "The Relative efficiency of whole and part methods of learning paired-associates as a function of the length of list", Doctoral Thesis, New Haven, Conn., Yale Univ. (1944).

ORR, DAVID, B.; FRIEDMAN, HERBERT L, and WILLIAMS, JANE, C. C., "Trainability of listening comprehension of speeded discourse", Journal of Educational Psychology, 56, (1965), pp.148-156.

OSGOOD, CHARLES E; SUCI, GEORGE J. and TANNENBAUM, PERCY H. "The Measurement of Meaning", Uni. of Illinois Press, Urbana, (1957), pp.342.

OSGOOD, CHARLES E. "A behavioristic analysis of perception and language as cognitive phenomena", Contemporary Approaches Tocognition, (1957), pp. vii + 210.

OTTO WAYNE and BRITTON, GWENYTH, "Sense-Impression Responses to verbal and pictorial stimuli", International Review of Applied Linguistics, 3, (1965), pp.51-56.

PAONE, JOHN W. "Another teacher's experience with remedial reading", Jesuit Educational Quarterly, 12, (1949/50) p.104.

PATTISON, BRUCE, "Psychological Aspects of Language Learning", Modern Languages, 45, (1964), pp.13-17.

PAVLOV, I. P. "Conditioned reflexes:" An investigation of the physiological activity of the cerebral cortex, OUP, (1927).

PASCASIO, E. M. "A descriptive comparative study predicting interference and facilitation for Tagalog speakers in learning English noun-head modification patterns," Unpublished doctoral dissertation, Uni. of Michigan, (1960).

PEEL, E. A. "Some psychological principles underlying programmed learning", Educational Research, 5, (1963), pp.17-18.

PENFIELD, W. and ROBERTS, L. Speech and train-mechanisms, Princeton Univ. Press (1959).

PETERSON, H. A. "Recall of words, objects and movements", Psychol. Rev. Suppl., 17, (1903), pp.207-233.

PIAGET, J. Logic and Psychology , Basic Books NY (1957).

PIAGET, J. and INHELDER, B. "The Growth of Logical Thinking", NY (1958).

PIERCE, JOE E., "Spectrographic Study of Vocalic Nuclei", Language Learning, 12, (1963), pp.241-247.

PIKE, KENNETH L. "Nucleation", MLJ, (1960), pp.291-95.

PIMSLEUR, P. "Experimental design in the language field", Mod. Lang. Forum, 42, (1957), pp.157-163.

PIMSLEUR, PAUL, "Under-achievement in Foreign Language Learning: Report Number One", Research Foundation report on Contract OE-2-14-004, (1962).

PIMSLEUR, P. and BONKOWSKI, R. J. "Transfer of verbal material across sense modalities", *J. Educ. Psychol*, 52, (1961), pp.104-107.

PIMSLEUR PAUL; SUNDLAND DONALD M; and MCINTYRE, RUTH D., *Under-achievement in foreign Language Learning ,* (Final Report), (1963).

PINCAS, ANITA M. "Linguistics and Aphasia", *The Journal of the Speech Therapy Asscn. of Australasia*, 15, (1965), pp.1-10.

POLITZER, R. L. "Student motivation and interest in elementary language courses", *Lang. Learning*, 5, (1953-1954), pp.15-21.

POSTMAN L. "Repetition and paired-associate learning", *American Journal of Psychology*, 75, (1962), pp.372-389.

POSTMAN, LEO and SENDERS, VIRGINIA L. "Incidental Learning and the Generality of Set", *Journal of Experimental Psychology*, 36, (1946),pp.153-165.

PRESSEY, S. L. "The Influence of color upon mental and motor efficiency", *American Journal of Psychology*, 32, (1921), pp.326-356.

PRESSEY, SIDNEY L; ROBINSON, FRANICS P; and HORROCKS JOHN E., *Psychology in Education*, Harper, NY, (1959).

RAVEN, J. C. "Note on Burt's 'The Distribution of Intelligence'", *British Journal of Psychology*, 50, (1959).

REID, L. S. "The development of noncontinuity behavior through continuity learning", *Journal of Experimental Psychology*, 46, (1953), pp. 107-112.

RICHARDS, I. A. *Speculative Instruments*, Kegan Paul, 50, (1955), pp.216

RIVERS, WILGA M. *The Psychologist and the Foreign-Language Teacher* Published Uni. of Chicago Press, Chicago (1964), 212 pages.

ROCK, IRVIN, "The role of repetition in associative learning", *American Journal of Psychology*, 70, (1957), pp.186-193.

ROCK, IRVIN, "Repetition and learning", *Scientific American*, (1958), pp. 2-5.

ROCK, IRVIN and HELMER, W. "Further evidence of one-trial associative learning", American Journal of Psychology, 72, (1959), pp.1-16.

ROGERS, C. R. and SKINNER, B. F. "Some issues concerning the control of human behavior", *Science*, 124, (1956), pp.1057-1066.

ROSENBERG, MILTON J. (ed.), Attitude organization and change: An analysis of consistency among attitude components, New Haven, Yale Univ. Press (1963).

ROSHAL, S. M. "Effects of learner representation in film-mediated perceptial-motor learning", Office of Naval Research, Technical Report SDC-269-7-5, (1949).

ROTHKOPF, ERNST Z. "Signal similarity and optimal signal arrangement of lesson and drill orders in alphabetic morse code training", Symposium on Air Force Human Engineering, ed. G. Finch & F. Cameron (1958), pp.188-193.

ROTHKOPF, ERNST Z. and COKE, ESTHER U. "Repetition Interval and rehearsal Method in Learning Equivalences from Written Sentences", DE CECCO, (1964), pp.251-266.

RUBENSTEIN H. and POLLACK, I. "Word Predictability and Intelligibility", Journal of Verbal Learning and Verbal Behavior, 2, (1963), pp.147-158.

RYAN, T. A. "Multiple comparisons in psychological Research", Psychological Bulletin, 56, (1959), pp.26-47.

SALTZMAN, I. J. "Delay of reward and human verbal learning", Journal of Experimental Psychology, 41, (1951), pp.437-439.

SALTZMAN, IRVING J. "Techniques used in the construction of a completely self-instructional, one semester , Modern College Course in Russian", SDLL, (1963), pp.167-178.

SANDER, VOLKMAR, "Sprache als Geistige Lebersform", The German Quarterly, (1960), pp.264-273.

SANDERS C. "Psychological and educational bases of academic performance", ACER Melb. (1961), pp.xiv + 164. (Research Series 74).

SAPON, S. M. "An application of psychological theory to pronunciation problems in second language learning", Mod.Lang.J., 36, (1952), pp.111-114.

SAPON STANLEY M. "Micro-analysis of Second-Language Learning Behavior", International Journal of Applied Linguistics, 3, (1965), pp.131-136.

SAPON S. M. and CARROLL, J. B. "Discriminative perception of speech sounds as a function of native language", Gen. Linguistics, 3, (1958), pp.62-72.

SAPORTA SOL. (ed.), 'Psycholinguistics: A Book of Readings , Published by Holt, Rinehart and Winston, 383 Madison Av.,NY, (1961), pp. xv + 551.

SAWYER, J. O.; ERVIN; SILVER; D'ANDREA and AOKI, 'The Utility of Translation and Written Symbols during the first Thirty Hours of Language Study , Univ. of California, Berkeley, (1962).

SAX, G. "Concept acquisition as a function of differing schedules and delays of reinforcement", Doctoral Thesis, Uni. S.Calif. (1958).

SCHERER, GEORGE A. C. "The Psychology of Teaching Reading through Listening", The German Quarterly, 23, (1950), pp.151-160.

SCHERER, GEORGE A. C. and WERTHEIMER MICHAEL, "The German Teaching Experiment at the University of Colorado", The German Quarterly, 35, (1962), pp.298-308.

SCHERER GEORGE A. C. and WERTHEIMER MICHAEL, "A Psycholinguistic experiment in Foreigh-Language Teaching", McGraw-Hill Book Co.Inc., NY, (1964), 246 pages.

SCHMIDT, A. G. *The effect of objective presentation on the learning and retention of a Latin vocabulary*, Chicago: Loyola Univ. Press (1923).

SCHONELL, FREDERIC JOYCE, *The Psychology and Teaching of Reading*, Oliver & Boyd, Edin (1961), reviewed AJE 5, (1961).

SCOTT, JOSEPH REID, "Can NDEA Language Institues Repay their debt to Institutions?", *Hispania*, 49, (1966), pp.93-101.

SEIBERT, LOUISE C. "An experiment on the relative efficiency of studying French vocabulary in associated pairs versus studying French vocabulary in context", *J. Educ. Psychol*, 21, (1930), pp.297-314.

SHEFFIELD, FRED, D. "Theoretical Considerations in the Learning of Complex Sequential Tasks from Demonstration and Practice", *SPI*, (1961), pp.13-32.

SHEFFIELD, FRED D.; MARGOLIUS, GARRY J. and HOEHN, ARTHUR J. "Experiments on perceptual mediation in the learning of organizable sequences", *SPI*, (1961), pp.107-116.

SHEFFIELD, FRED D., and MACCOBY, NATHAN, "Summary and Interpretation of research on organizational principles in constructing filmed demonstrations", *SPI*, (1961), pp.117-140.

SHINE R. E. and FREILINGER, J. J. "Are you really helping your Child Learn Speech?", *Today's Speech*, 2, (1963), pp.12.

SICILIANO, E. "An Experiment in listening comprehension", *MLJ*, 43, (1959), pp.226-7.

SIDOWSKI, J. B.; KOPSTEIN, F. F. and SHILLESTEAD, ISABEL J., *Proposal for an experiment to examine the influence of several factors on the efficacy of a prompting versus a confirmation procedure in programming*, 59-1 Wright Air Development Center (1959).

SIDOWSKI J. B. ; KOPSTEIN, F. F. and SHILLESTAD, I. J. "Prompting and confirmation variables in verbal learning", *Psychological Reports*, 8, (1961), pp.401-406.

SIEGEL ARTHUR I. and WOLF, J. JAY, "A Model for predicting two-man team performance in man-machine systems" *APA Meeting*, NY (1961).

SILBERMAN, H. F. *Review of Educational Research*, 53, (1962).

SIXBEY GEORGE L. and POWERS, GLENN F. "Game Factor in Learning", *MLJ*, (1961), p.321.

SMIRNOV, I. *The Psychology of Memorisation*, Academy of Pedagogical Sciences, Moscow Univ. (1948).

SMITH, EDGAR, A. *Reinforcement Psychology in Special Education*, paper presented at American Psychological Asscn. Chicago (1960).

SMITH, K. R. and E. B. VAN ORMER, Learning Theories and Instructional Film Research, Office of Naval Research, Port Washington, (1949).

SMITH, WENDELL I. and MOORE, J. WILLIAM, "Size of Step and Cueing", Psychological Reports, 10, (1962), pp.287-294.

SNEDECOR, G. W. Statistical Methods , Ames,IOwa State College Press, 5ed (1959).

SNYGG, D. "Address to Davi at NEA Convention 1960", A-V Instruction, 6, (1961), p.276.

SNYGG, DONALD, "The Tortuous Path of Learning Theory", AVI, 7, (1962), pp.8-12.

SOKOLOV, ALEXANDER, N. "Silent speech and the study of FLs", Voprosy Psichologii, 5, (1960), pp.57-64.

SONTAG, L.; BAKER, C. T. and NELSON, VIRGINIA L. "Mental Growth and personality development: A Longitudinal Study", Monograph Soc. Res. Child Development, 23, (1958).

SPAULDING, SETH, "A Spanish readability formula", MLJ, 40, (1956), pp.433-441.

SPEARRITT, DONALD, Listening Comprehension, a Factorial analysis", ACER, (1962).

STEIN, JAY, W. "Schizophrenia in becoming educated", School and Society, 88, (1960), pp.461-463.

STEPHENS, A. L. "Certain special factors involved in the law of effect", ABstr. doctoral Dissertations, Ohio State Univ. (1953),No.64.

STOLUROW, LAWRENCE M. "Social Impact of PI: Aptitudes and Abilities Revisited", American Psychological Asscn. Annual Convention Symposium on PI, (1962), rp De Cecco (1964), pp.348-355.

STONE, G. R. "The training function of examinations: retest performance as a function of the amount of critique information", Lackland Air Force Base, Texas (1955), AFPTRC-TN-55-8.

SYMONDS, P. and CHASE, D. H. "Practice vs motivation", Journal of Educational Psychology, 20 (1929), pp.12-35.

TAYLOR, J. A. and SPENCE, K. W. "The relationship of anxiety level to performance in serial learning", Journal of Experimental Psychology, 44, (1952), pp.61-64.

TAYLOR, STANFORD B. "Speed Reading VS Improved Reading Efficiency", An EDL plan for a junior high and high school developmental reading program, Educational Developmental Laboratories, Huntington, NY, (1962).

THOMPSON, BERTHA B. "A Longitudinal Study of Auditory Discrimination", The Journal of Educational Research, 56, (1963), pp.376-378.

THOMPSON, G. C. and HUNNICUTT, C. W., "The effect of praise or blame on the work achievement of 'introverts' and 'extroverts'", *Journal of Educational Psychology*, 35, (1944), pp.257-266.

THOMPSON, W. C. "A book versus machine experiment in Adult reading improvement", *College English*, 15, (1954), pp.471-473.

THORNDIKE, E. L. "Memory for paired associates", *Psychol. Rev.*, 15, (1908), pp.122-138.

THORNDIKE E. L. *The psychology of Learning*, Teacher's College, Columbia Uni. NY (1913).

THORNDIKE, E. L. Reward and punishment in animal learning, *Comparative Psychology Monograph 8*, No. 39 (1931).

THORPE, LOUIS P. and SCHMULLER, ALLEN M. *Contemporary Theories of Learning*, Ronald, NY, (1954).

TITONE, RENZO, "La Psicolinguistica Oggi", published by PAS-Verlag, Roma, (1964).

TITONE, RENZO, "A Psychological Preface to the Teaching of Modern Languages", *Orientamenti Pedagogici*, 7, (1960), pp.266-282.

TITONE, RENZO, "Studies in the Psychology of Second Language Learning", published by PAS-Verlag, Roma, (1964).

TOBIAS, S. and WEINER, M. "Effect of Response Mode on Immediate and Delayed Recall from Programmed Material", *Journal of Programmed Instruction*, 2, (1963), p.9.

TOLMAN, E. C. *Purposive behavior in Animals and Men*, Appleton-Century-Crofts, (1932).

TOMATIS, A. "Relations entre l'audition et la phonation", *Cahiers D'Accoustique*, 74, (1956).

TRAVERS, JOHN F. "The Fascination of Phonics", *Education*, 84, (1963), pp.19-22.

TRAXLER, A. E. "Value of controlled reading: Summary of opinion and research", *Journal of Experimental Education*, 2, (1943), pp.280-292.

TROMP, J. B. "The Influence of Nervousness on Intelligence Test Scores", *Journal of Nat. Inst. Personn. Res.*, 6, (1956).

TUCKER, J. A. "The Job as a Medium for Training", in Glen Finch (ed.) *Education and Training Media*, (1960), pp.53-68.

TURING, A. M. "Computing machines and intelligence", *Mind*, 59, pp.433-460.

UNDERWOOD, B. J.; "Speed of learning and amount retained: A Consideration of methodology", *Psychological Bulletin*, 51, (1954), pp.276-282.

UNDERWOOD, BENTON J. "Verbal Learning in the Educative Processes", *Harvard Educational Review*, 29, (1959), pp.107-117

UNDERWOOD, B. J.; REHULA, R. and KEPPEL, G. "Item selection in paired-associate learning", American Journal of Psychology, 75, (1962), pp.353-371.

UNDERWOOD, BENTON, J., and SCHULZ, RUDOPH W. "Meaningfulness and verbal learning", Lippincott, NY, (1960).

VAN ATTA, L. "Behavior in small steps", Cohtemporary Psychology, 4, (1961), pp.278-381.

VERNON, PHILIP EWART, "Personality assessment: A Critical Survey", Methuen (1964).

VERNON, P. "The Structure of Human Abilities", London, Methuen (1951).

VERNON, P. "Symposium on the Effects of Coaching and Practice in Intelligence Tests", British Journal of Educational Psychology, 24, (1954).

VERPLANCK, W. S. "The control of the context of conversation: reinforcement of statements of opinion", Journal of Abnormal Social Psychology, 51, (1955), pp.668-676.

VERPLANCK, W. S. "A Glossary of some terms used in the objective science of behavior", Psychological Review, 64, (1957),

VERPLANCK, W. S. "The operant conditioning of human motor behavior", Psychological Bulletin, 53, (1956), pp.70-83.

VERPLANCK, W. S. and HAYES, J. R. "Eating and drinking as a function of maintenance schedule", J. Comp. Physiol. Psychol., 46, (1953), pp.327-333.

VOTAW, D. F. and DANFORTH, L. "The effect of method of response upon the validity of multiple choice tests", Journal of Educational Psychology, 30, (1939), pp.624-627

WAHGREN, HARDY, L. "Student reaction to a self-tutoring introduction to a Science of human behavior", APA Meeting NY, (1961).

WALLACH, H. and HENLE, M. "An experimental analysis of the law ofeffect", Journal of Experimental Psychology, 28, (1941), pp.340-349 .

WANGLER, HANS-HEINRICH, "Psychophonetische Untersuchungen uber die Stimme", Zeitschrift fur Phonetik und allgemeine Sprachwissen-Schaft, 12, (1959), pp.335-346.

WARREN, A. B. and BROWN, R. H. "Conditioned operant response phenomena in children", Journal of General Psychology, 28, (1943), pp.181-207.

WATSON, J. B. "Psychology as the behaviorist views it", Psychol.Rev. 20, (1913), pp.158-177.

WATSON, J. B. "Psychology as the behaviorist views it", Psychological Review, 20, (1913), pp.158-177.

WECHKIN, S. "Word Learning in an Automated Teaching Situation as a Function of Display Condition", Journal of Educational Psychology, 53, (1962), pp.165.

WILLIAMS, JOANNA, P. "Supplementary report: A Selective artifact in Rock Study of the role of repetition", Journal of Experimental Psychology, 62, (1961), pp.627-628.

WIMER, CYNTHIA and LAMBERT, WALLACE E. "The differential effects of word and object stimuli on the learning of paired associates", Journal of Experimental Psychology, 57, (1959), pp.31-36.

WOLFLE, D. "Training", S.S. Stevens (ed.) Handbook of Experimental Psychology, (1951).

WOOD, MARION, "Do you help build the professional secretary's listening quotient?", Business Education World, 43, (1963), pp.27-30.

WOODWORTH, R. S. "A Contribution to the Question of 'Quick Learning' Quick Forgetting", Psychological Bulletin, 11, (1914), pp.58-59.

WOODWORTH, R. S. Experimental Psychology, New York, Holt, (1938).

WOODWORTH, R. S. and SCHLOSBERG, H. Experimental Psychology, Holt, NY, (1954),

SULFF, J. JEPSON and KRAELING, DORIS "Familiarisation procedures used as adjuncts to assembly-task training with a demonstration film", SPI, (1961), pp.141-154.

WULFF, J. JEPSON and EMESON, DAVID L. "The Relationship between 'what is learned' and 'how it's taught'", SPI, (1961), pp.457-470.

WULFF, J. JEPSON and STOLUROW, LAWRENCE M. "The Role of class-descriptive cues in paried-associate learning", SPI, (1961), pp.445-456.

WYCKOFF, L. B. "The Role of observing responses in discrimination learning", Psychological Review, 59, (1952), pp.431-432.

ZIERER, ERNESTO, "Informational Psychology - Its Importance for the Study of Foreign Languages", Paper presented at the Third- Inter-American Symposium in Linguistics, (1966).

ZIPF, GEORGE K., Selected studies of the principle of related frequency in Language, Harvard Uni. Press, Cambridge (1932).

BANATHY, B. "Common Concepts foreign Lang. Test....... MLJ, 46, (1963), p.363.

MCKAY. L. R. "Some Pitfalls in Teaching Foreign Languages", Sch. & Soc., 8. (Reply to L.R. McKay).

## LANGUAGE LABORATORIES

"Apparatus and the word, America's language laboratories", *Times Ed Sup 2295* (1959)

"Approaches and Methods in Foreign Language Teaching", *Babel* 15 (1960), p.15, *MLTAV*

"Audio-visual techniques and the language laboratory," bibliog *J Ed Sociol*, 35, (1962), pp 271-7.

"Le biplex ou l'Anglais pour les Specialistes", *Revue Petroliere* no 1043 (1962), Bureau de Preparation Linguistique des Experts, Paris.

"The College Lang Lab", *University of Michigan Lang Lab Pub V*, College of Literature, Science and the Arts, University of Michigan,(1961,)pp 110.

*Constitution du Service des Laboratories de Langues*, Paris, 5pp.

"Do-it-Yourself for £750", *Times Ed Sup (London)*, 2455, (1962), p. 1185.

"Dozen do's and don'ts for planning and operating a lang. lab; or an electronic classroom in high school", *High Points*, 44, (1962), pp. 69-71, *N Assoc of Secondary-School Principals Bul* 46 (1962) pp. 120-2, *Mod Lang Assoc.* NY, (1961), p.4

"A Dozen Do's and Don'ts for Planning and Operating a Language Lab or an Electronic Classroom in a High School", *MLA Ivory Basement News*,(1961.)

*Educational Foundation for Visual Aids Ltd*, E.F.V.A. Lang Lab, London.

"Educators say Lingua-Trainers are big success", *Mid-Atlantic Newspaper Services Inc.*, Harrisburg, Pa,(1960.)

"Electro-acoustic in the Service of Lang Study", *Philips Eindhoven* (1961).

"Electronic Futures Arranges Overseas Distribution Program", *The New Haven Register*, (1962).

"Equipment for Linguists", *Times Ed Sup*. 2434, 46 (1962).

"An Experiment in the Use of the Record for the Teaching of English", *Oversea Visual Aids Centre*, 1961.

"Faster by Machine", *Times Ed Sup*, (1962), p.950.

"Filmstrips explain language lab", *Mich Ed J*, (1964),

"FL courses use electronic lab", *Catholic School J*, 59 (1959),p.14.

"FL Facilities in High Schools", *Minnesota School Facilities Council*, The Council, St Paul, (1962), pp46.

"Foreign lang labs in schools and colleges", *American School Board J*, 139 (1959), 25-6 excerpts.

"Foreign lang. labs in schools and colleges", *US Office of Ed Bul*, (1959), pp.

"Foreign Language Laboratory Techniques", suppl. of LFLTA News Letter, Baton-Rouge, 1956.

"A Glossary of Tape-recording terms", Audio-Visual Guide (1955) pp. 21-3.

"Guide for the Development of Language Laboratory Facilities", CDE, Sacramento, 1960, p.37.

"A Guide for the Development of Lang. Lab. Facilities", Bureau of Audio-Visual Education and Bureau of NDE, CSDE, Sacramento, 1959.

"How and when to buy a language lab." School Management, 5, (1961), pp. 51-3.

"How effective are language laboratories?" Canadian Teachers' Federation Newsletter, 19, (1963), p.4.

"Laboratoria voor vreemde Talen in de V.S.", p. 988, St. Bonaventura, 1959.

"Laboratorium voor audio-visueel Taalonderricht", (Woord vooraf door Prof. Fr Van Passel).

"The Language Laboratory", Monograph Series, Language and Linguistics, (1951), pp. 52-74.

"The Language Laboratory", Monograph Series, Language and Linguistics, (1952), pp. 31-58.

"The Language Laboratory", FL Bulletin, (1956), 20pp.

"The Language Laboratory", FL Bulletin, (revised 1956)

"The Language Laboratory and the Classroom - An American View", Monash Univ Lang Lab RP.

"Lang Labs, an Agonizing Reappraisal", Overview, 1, (1960),pp.45-7.

"Language Labs."an undated report, Sch Mgt, 7 (1963), pp 85-92.

"Lang. lab at NYU", School and Society, 89, (1961), p.168.

"Language Laboratory at Pomona", Higher Ed, (1955), p.86.

"Lang Labs show superior results", Chicago Sch J, 44, (1963),p.288.

"Language Laboratory Training", select reading list, British Council, Educational Aids Unit, (1963).

"Learning by listening to tapes", Sch and Soc, 92, (1964).

"Learning music in the language laboratory", Sch and Soc, 90,(1962)

"Lingua Trainer Sparks Foreign Languages at MHS (Minnetonka High School)", Minneapolis Suburban Newspapers - The Hennepin County Review, (1962).

"Machines for Lang. Teaching", Sch and Soc, (1960), p.400

"Modern FLs in High School: the Lang. Lab.", US Office of Ed Bul, 1, (1906) "Modern Techniques in Teaching FLs: Language Laboratories", Conneticut Audio-Visual Ed Assoc., Annual Bulletin, 19, Bibliog. 2, 1960.

"Next Development for Learning Labs", Overview, 3, (1962), pp.38-40+.

"101 uses: how to get the most out of a magnetic tape recorder", Brush Development Company, Cleveland, Ohio.

"Operational Requirements, Technical Requirement, Mechanical Requirement", Technical Requirement Specifications for Design Manufacture and Installation of Binaural Lang Lab Equipment at the RAAF School of Languages RAAF Base, Point Cook, Victoria - extracts.

"Optical Aids", Educational Pamphlet No. 115, HMSO, Lond. (193 ), 92 pp.

Outline of Services and Guide to Language Laboratory Planning, Washington, Electronic Teaching Laboratories, 1958.

"Proceedings of the First Conference on the Role of the Lang Lab in the Secondary School", University of Michigan, LL, (1961).

Publications of the Language Laboratory, Ann Arbor, Michigan, 1958-

"Purdue University's Electronic Lang. Lab.", Audio-Visual Guide, (1953), pp. 29-30.

Report on the Second Annual Round Table Meeting on Linguistics and Language Teaching. See Begue, and Dostert.

"RAAF School of Languages: The Language Laboratory - general", RAAF Sch of Lang, RAAF Base, Point Cook, (1963), 5 pp.

"Russians study in bed - no discipline rejected", Times Ed Sup, (1964), p.972.

"Schoolman's guide to language labs", Sch Management, 5 (1961), pp. 49-50., condensed in The Ed Digest, 27, (1961), pp. 11-14.

"Science Comes to Languages", Fortune, 30, (1944), pp. 133-135; 236-240.

Secondary School Laboratory. Some Observations on Present Practices and Long-Range Possibilities, Reports of the Working Committee, (1956).

"The Situational Method", Babel 6, (1957), MLTAV.

"Source Materials for Secondary School Teachers of Foreign Languages", US Office of Ed, (1962)

"Specifying Procedures for Language Labs," Am Sch & Univ, 36, (1964), pp. 28-30.

Spanish Pronunciation, Language Laboratory Manual, Wilmac Recorders, Pasadena, Cal.

"Standards for Materials and Equipment for the improvement of instruction in Science, Mathematics and FLs", 1958, 42 pp. CCSSO, Washington.

"Suggestions for teaching foreign languages by the audio-lingual method", Calif Dept. Ed

"Survey of FL Labs in secondary schools and institutions of higher education", US Office of Ed Circular, (1958), 33 pages.

"Taallaboratorium in het Vormingsinstituut te Kortrijk", Philips Echo, 4 (1962)

"Tape-pals", UNESCO Features 384/385 (1961) p.18, UNESCO Features 387 (1961), p. 22.

"Using Laboratory Techniques in teaching foreign languages in New York City Schools", BECNY, NY, (1961).

"Using the Tape Recorder,"Curriculum Bulletin (1952/3)

"Die Verwendung des Tanbandgerates im Sprachunterricht", (Telefunken Sonderdruck nach einem aus den Franzosischen uebertragenen Bericht des Centre Audio Visuel de Saint Cloud.)

"Voluntary study with the aid of magnetic tape increases use of Princeton's LL by 50%", Ed Screen and Audiovisual Guide, (1961), pp. 212-3.

"What do we know about Teaching Modern Foreign Languages?", Audio-Visual Instruction, 4 (1959), pp. 189-220.

ACKERMAN, Arthur S., "Audio-visual techniques and the language laboratory," bibliog. J Ed Sociol, 35, (1962), pp. 271-7.

ACKERMAN, Arther S., "Relating the content of the taped materials with the textbook", bibliog., J Ed Sociol, 35, (1962), pp. 274-6.

ADAMS, Sam, and BENOIT, Doline, "A Language Laboratory for the Smaller College", Mod Lang J, 38, (1954), pp. 421-22.

AHLES, Richard F., "French needn't be Greek any more", University Alumnus, (1959), pp 10-11.

ALEXANDER, P, "Language study new methods for the young and not-so-young: an adult laboratory", Ed Mag, 19, (1962), pp. 253-255.

ALEXANDER, P, "Laboratories for teaching languages", Curric News, 1, (1962), pp. 172-175.

ALEXANDER, Theodor W, "Functional German at Texas Tech College; An Audio-Visual Approach", German Q, 28, (1955), pp. 175-79.

ALHINC, J (Besançon), and CLAY, M : LEON, P "Laboratoire de langues et classes audio-visuelles", Etudes de Linguistique Applique, 1, (1962), pp. 156-167.

ALHINC, J. CLAY, M and LEON, Pierre Roger, "Le laboratoire de langues et la classe audio-visuelle dans une experience d'enseignement accelere de l'anglais parle au Centre de Linguistique Appliquee de l'Universite de Besancon", Etudes de Linguistique Appliquee, 1, (1962), pp. 156-67.

AUDIO VISUAL Techniques and the Language Laboratory, Bibliog J Ed. Sociol, 35, (1962), pp. 271-7.

ALKONIS, Nancy V., and BROPHY, Mary A., "A Survey of FLES Practices", **MLA America**, (1959-1961), pp. 213-217.

ALLEN, Edward David, "The Effects of the Language Laboratory on the Development of Skill in a Foreign Language", Mod Lang J, (1960), pp. 355-58.

ALLEN, Edward David, "Lang lab in learning FLs", Theory into Practice (Ed Res Bul), 1 (1962), pp. 20-24.

ALLEN, Edward David, "Modern language teacher makes Latin drills for the laboratory", Classical J, 57 (1962), pp. 160-3.

ALPERN, H , and KATSH, A I , "Audio-visual Materials in Foreign Language Teaching", Report of the 16th FL conference 1949 published by Dept of FL & Lit, Sch Ed, NYUni, 1950.

ANDERSON, Eugene W, "Review and Criticism (Keating Report)", Mod Lang J, 48 (1964), pp. 197-207.

ANDRADE, Leonor, "Lang lab in teacher training", Mod Lang J, 44, (1960), p.330.

ANDRETZ, S. N., "Extra dividends from an audio laboratory", Ed Screen Av G, 42, (1963), pp. 622-3.

ANGIOLILLO, Paul F., Armed Forces' Foreign Language Teaching, New York, Vanni, 1947.

ANGIOLILLO, Paul F., "Principles and Methods of FL Teaching in the School", Improving Ed in Ky, 26, (1954), p. 3.

APPLEGATE, Joseph R., "New lab for M.I.T.", Ed Screen, 39 (1960), pp. 176-8.

ARCHER, John B., "Report of the Committee on the Philosophy of the Language Laboratory", Massachusetts Institute of Technology, pp. 47-59.

AVERY, M., "Tool for Learning," Tex Outl, 46 (1962), p.10.

BANATHY, Bela H., "A Test of Significance of the Class-Laboratory", **MLA**, (1963).

BARANSKI, Kenneth E, "general letter on 7 points", "the treatment of 'culture'", "how grammar is taught", "the intensity and thoroughness of drills", "how reading is taught", "how writing is taught", "students are prepared for tests", "flexibility and economy of audio programs", "h'wk problem".

BARNS, I.W., "Language laboratories", Aust. Teacher, 39, (1963), pp 29-32.

BARRICK, Mac E., "Variety and Language Lab Success", Mod Lang J, 45, (1961), pp. 361-365.

BARRIO, Margaret del, and HOCKING, Elton, "A New Dimension to Teaching Languages", NEA J, (1955), pp.82-83.

BARRIO, Margaret del, and HOCKING, Elton, "A New Dimension in Teaching Languages", NEA J, 44, (1955), pp. 82-84.

BARRON, J , Roy, "Flexible design for lang. labs", Ed Screen and Audio-Visual Guide, 40, (1961), p. 175.

BARRON, J , Roy, "Let's not forget about A-V tools", The American Sch Board J, 139 (1959), pp. 21-22.

BARROW, Mrs. Richard, "The New Way to Teach Foreign Languages", Sch Management, (1958), pp. 24f, 641.

BARTLE, G , "Music in the Language Classroom", Babel, 19, (1962), MLTAV.

BASHOUR, Dora S.,"Language laboratories and the study of foreign languages", NY Soc Exp Study Ed Yrbk, (1961), pp. 44-46.

BASSETT, Ralph W., DE BERNARDIS, Amo, LESTER, McKim W., "Report of Working Committee II", FL Labs in the Sec Sch of the North West.

BASTIAN, J. Wallace, "Slides and Tape in Language Teaching", Ed Screen, 32, (1953), pp. 347, 361.

BAUER, Eric W., "Audio-visual aids and lang teaching in the USSR", Audio-Visual Communication R, (1960).

BAUER, Eric Wolfgang, "An Experimental Study of the Achievement in Learning a Foreign Language through Comparison of Classes Taught with and without Audio-Aids of the Language Laboratory". Unpublished Master's thesis, DePauw University, 1959.

BAUER, Eric Wolfgang, "A Study of the Effectiveness of Two Language Laboratory Conditions in the Teaching of Second Year German", IRAL, to appear.

BEGUE, Armand, "The Language Laboratory", Second Annual Round Table on Linguistics, Washington, Georgetown University, 1951.

BENNETT, William A., "The Integration of Language Laboratory and Classroom Teaching", Visual Ed, (1964), pp. 7-9.

BERNARD, Edward G., and LORGE, Sarah W., "The Relative Effectiveness of Four Types of Language Laboratory Experience". Research supported in part by the NY State Ed Dept, 1962-63.

BERNARD, Edward G., and LORGE, Sarah W., "The Use of the Language Laboratory in the Teaching of French in Secondary Schools. Research supported by the NY State Ed Dept, 1959-62.

BILLOWS, F L , The Techniques of Language Teaching , London, Longmans, 1961.

BIRKMEIER, Emma Marie, "The Future in Mod Langs: Bandwagon or Balance?", NAJAM, Edward W.,"Materials and techniques in the LL" rep 2nd LL conference 1961, IJAL, 28 (1962), pp. 141-149.

BENWELL, Frank P, "The Language Laboratory and Modern Language Teaching by Stack, Edward M", Mod Lang J, (1961), pp. 96-97.

BIRD, Eugene H , "How we use our lang lab at the For. service institute", J Ed Sociol, 33, (1960), pp. 234-9.

BLEW, G S , and WELCH, L J , "Language labs: will your teachers use them?", Sch Management, 5, (1961),pp.69-71.

BONIN, A I , "Lang. lab approach to teaching Eng to the foreign student", Junior Col J, 31, (1960), pp. 104-6.

BONTEMPO, O. A., "The Language Workshop", MLJ, 30, (1946), pp. 319-327.

BORGLUM, George, "Mod. Lang. AV Project", MLJ, (1958), pp. 325-328.

BORGLUM, George, "Modern Language AV Research Project", Wayne State University, (1960).

BORGLUM, George, "A Research experimental lang. lab", French R, 31, (1958), 436-8.

BORGLUM, George, "Revolution in the Teaching of Modern Foreign Languages", Sch and Society, 79, (1954), pp. 129ff.

BORGUM, George, "The Visual in Audio-visual Lang Teaching", French R, 32, (1959), pp. 53-58.

BORGUM, George, "What is the A-V score now?", Oinas, Felix J. (ed), Language Teaching Today, rep LL Conf. Indiana Uni, (1960), p. 22-23.

BORGLUM, George, MUELLER, Theodore, "Audio-visual language teaching", French R, 31, (1958), pp. 528-533.

BORGLUM, George, MUELLER, Theodore, "Addendum to language laboratory and target language", French R, 30, (1956), pp. 58-59.

BORGLUM, George, MUELLER, Theodore, "Lang. Lab and Target Lang", French R, 39, (1956), pp. 322-331.

BOROFF, David, "The Three R's and Pushbuttons", NY Times Magazine, (1960).

BOTTKE, Karl C., "French Conversation Laboratory", French R, (1944), pp. 54-56.

BOURQUE, Jane M., "Time-Saving Techniques for Lab and Classroom", French R, 37, (1964), pp. 568-574.

BOVINET, Wesley G., "Glenbrook reports on four experiments on utilization of staff", NA Sec Sch Principals Bul, 44 (1960), pp. 244-53.

BRALEY, Ian, "Will robots teach your child?", Today's Living, 1960.

BRATNOBER, Harry L., "Launching a lang. lab and its program", High Sch J, 44 (1960), pp 79-84.

BRENES, Edin, "Development of the Purdue Audio-Visual Materials", SDLL, (1963), pp 131-136.

BRENES, Edin, and SMITH, George E., "Tape Recording Techniques for Language Laboratories", Hispania, 37, (1955), pp. 303-305.

BRIGHAM, Robert L., "Redondo lang. lab.", American Sch Board J, 141, (1960)

BRIGHAM, Robert L., "Try a Business Education Laboratory", American Sch Board J, 140, (1960), p. 22.

BRINCKMAN, William W, "Instruction in Foreign Languages", Sch and Society, 71, (1950), pp. 53-60.

BROOKS, Nelson, "Learning a Modern Foreign Language for Communication", Reports of the Working Committees of the Northeast Conference on the Teaching of Foreign Languages, New York

BROOKS, Nelson, "The secondary school language laboratory: some observations on present practices and long range possibilities", Report of Working Committees of the NE Conference on Teaching FLs, (1956), Yale Uni, New Haven, Conn.

BROOKS, Nelson, "Using tape to test the language skills", SDLL, (1963), pp. 121-128.

BROWN, Charles T., "Three Studies of the Listening of Children", Speech Monographs, 32, (1965), pp. 129-138.

BROWN, James W., LEWIS, Richard B., HARCLEROAD, Fred F., AV Instruction: Materials and Methods, NY, McGraw Hill, 1959, 2ed 1964.

BROWN, John I., "Designing laboratories for languages", Electronics Weekly, (1965), pp. 7-8.

BRUBAKER, Charles William, "Architecture and Equipment for the LL", NAJAM, Edward W., "Materials and Techniques in the LL", rep 2nd LL conference 1961, IJAL, 28 (1962), pp. 181-198.

BRUSHWOOD, John S. and POLMANTIER, Paul C., "The Effectiveness of the Audio-Laboratory in Elementary Modern Language Courses", The University of Missouri Bul, 54 (1953), 14 pages.

BUCH, John N., "Using Variations of Language Laboratory Equipment with High School Students in Beginning French", NDEA, 7, (1963).

BUCHELT, Walter, "Uber die Entwicklung von Kabinetten fur den Fremdsprachenunterricht", Fremdsprachenunterricht, 8, (1964), pp 133-46.

BUKA, M., FREEMAN, M.Z., LOCKE, W.N., "Language Learning and Frequency Response", Najam (ed), Materials and Techniques for the Language Laboratory, IJAL, 28 (1962), no 1, part II (suppl).

CABLES, Virginia, "The Language Laboratory: Boon or Bane?", French R, 39, (1966), pp. 618-622.

CADOUX, Remunda, "Teacher-Training by TV: An Effective Device", MLA Conference, 29, (1965).

CAPRETZ, Pierre J., "The Production of Materials for the Language Lab", {Publications of the Language Lab 5, pp.44-57}.

CARNINE, Kathryn, "Language labs will not erase role of teacher", Calif Teachers' Assoc J, 57, (1961), p.25

CARROLL, John B., "Wanted: A Research Basis for Education Policy on Foreign Language Teaching", Harvard Ed R, (1960), pp.128-140.

CARRINO, Frank G. and SKIDMORE, Willard E, "Every Foreign Language Classroom Should be a Laboratory", Casdaids, 5, (1953-54), pp.24-28.

CARTLAND, H E , "West Point AV story: audiovisual in foreign language study", Ed Screen Av G, 43, (1964), pp. 24-5.

CAUTHEN, H F , "Backwards via 'Aid'", MLJ, 48, (1964), p. 207.

Late entry:

BUNG, Klaus, Programmed Learning and the Language Laboratory, 2, London, Copyprints Ltd., (1967).

CHANGNON, Pauline E., "Students on their own", Illinois Ed, (1958), pp. 138

CHAREST, Gerard J., "The Language Laboratory and the Human Element in Language Teaching", Mod Lang J, 46, (1962), p. 268.

CHATMAN, Seymour, "Report on Possible Applications of Sound Spectrography in the Language Laboratory", System Development Corporation Field Note, (1962), pp. 1-10.

CIOFFARI, Vincenzo, "The Influence of the Lang Institute Program, Past-present-future", Mod Lang J, 46, (1962), pp. 62-68.

CIOFFARI, Vincenzo, "What can we expect from the Lang Lab?", Mod Lang J, 45, (1961), pp. 3-10.

CLARK, E.J., "The Laboratory Practice Approach to Citizenship Education", Indiana Teachers' Col J, 23, (1951), 8 et seq.

COHEN, Leon J., COOK, Charles H., "Shortwave Radio in Lang Teaching", Mod Lang J, (1950), pp. 199-203.

COLE, Allan B., "Audio-Aids in Mod Lang. Instruction", Harvard Ed R, (1946), pp. 92-97.

COLEMAN, C.W. "The French Laboratory at the University of Nebraska", FR, 24, (1951), pp. 336-40.

CONWELL, Marilyn, "An Evaluation of the Keating Report", Bul NA Sec Sch Principals, 48, (1964), pp. 104-15.

COOKSON, Frank B., "Tape and Teaching", NEAJ, 39, (1950), p.370.

COOPER, W L , "J Sterling Morton High School and Jr. Coll. Cicero Ill uses tapes, lang. labs and team teaching", NA Sec Sch Principals Bul, 45 (1961), pp. 79-84.

COOPER, W L , "Use of tapes, lang lab and teaching teams at the J Sterling Morton High School and Junior College", NA Sec Sch Principals Bul, 44 (1960), pp. 233-43.

CORDER, S. Pit, "The Language Laboratory", Engl Lang Teaching, 16, (1962), pp. 184-188.

CORNBERG, Sol, "Electronic Classrooms - a new era?", Radio, Television and Hobbies, (1964), pp. 9-10.

COTTRELL, W, "Foreign Language Laboratory", Va J Ed, 53, (1959), pp. 15+

COUSINO, Bernard A, "Tape of Babel. a discussion of recent developments in the planning design of lang. lab with glossary of technical terminology", rp from tape recording, Washington, Information Center Service

CRAIG, Donald M., "Poor Man's lang lab", Calif J Sec Ed, 35, (1960), pp. 215-8.

CRANE, Loren D., "Language labs overemphasised", Audio-Visual Instruction, 7 (1962), p. 55.

CROMPTON, J Stuart, "Progress with the Mobile Language Laboratory, ML, 47, (1966), pp. 54-55.

CUTHBERT, BROTHER, "Some thoughts on Language Laboratory Equipment", Nat. Cath. Ed. Assn. Bul., 58, (1961), pp. 277-81.

CROSSMAN, DAVID M., "Reports of the Keating Report", American School and University, 36, (1963), pp. 35, 38.

DAVIES J. C. "The Study of French in the U.K. and in Australia", Babel, 25, (1964), pp. 3-10

DE BAZAN, B.M., "Drama Tapes: A Transitional Device for Foreign Language Students, " Av. Instr., 7, (1962), pp. 280-1.

DE BERNARDIS, AMO, "Some Guidelines for Planning Foreign Language Laboratories" in Najam (ed.) Materials and Techniques in LL. in International Journal of American Linguistics, 28, (1962), pp. 131-137.

DELATTRE, PIERRE C., "Comment Tester la Facilite de Parole dans un Laboratoire de Langues?", Le Francais dans le Monde, 3, (1961), pp. 36-38.

DELATTRE, PIERRE C., "Un Cours d'exercises Structuraux et de Linguistique Appliquee", French Review, 33, (1960), pp. 591-603.

DELATTRE, PIERRE C., "Development & Modification of Instruments for the Electronic Analysis & Synthesis of Speech & Application of Them to the Phonetic Comparison of Eng. with Fr., Germ., & Span. Project 8,366"(NDEA Title 6), (1959-1960).

DELATTRE, PIERRE C., "La Lecon d'intonation de Simone de Beauvoir, etude d'intonation declarative Comparee", French Review, 35, (1961), pp. 59-67.

DELATTRE, PIERRE, "Quality in tape Recording and Voicing", SDLL, (1963), pp. 55-60.

DELATTRE, PIERRE C., "Testing Audio Equipment by Ear", Audio Visual Instruction, (1963), pp. 156.

DELATTRE, PIERRE C., "Testing Students' Progress in the Lang. Lab.", Language Teaching Today, 26, (1960), pp. 77-93.

DELATTRE, PIERRE C., "Testing the Oral Production of Lang. Students", Publications of the Language Lab. (1961), pp. 25-43.

DELATTRE, PIERRE C., "Testing Students' Progress in the Lang. Lab.", in Oines (ed.) Language Teaching Today in International Journal of American Linguistics, 26, (1960), pp. 77-96.

DELATTRE, PIERRE C., "Travaux d'Etudiants au Laboratoire de Phonetique Experimentale de l'Ecole Francaise de Middlebury", Summary of Certain problems worked out in the experimental phonetics laboratory at Middlebury, FR, (1943), pp. 504-510.

DE MANDACH, ANDRE B. and BATES, JEFFERSON D, Setting up your own little Lang. Lab.,: A Low cost Recipe, Shakespeare Tape Library, Washington, (1954), pp. 30.

DONALDSON N., "Financing and Budgeting the Lang. Labs.", Kentucky University, (1960), pp. 93-7.

DOSCHEK, A., "Make your language Lab. Specifications Meaningful", Il An Sch. Bd., 145, (1962), pp. 22.

DOSTERT, LEON E., Applied Linguistics in Language Teaching, Washington D.C., Georgetown University Monograph Series, 6, (1954).

DOSTERT, LEON E., "Certain Pedagogical Concepts for the Use of Audio Aids in Language Teaching", FR, 27, (1954), pp. 423-427.

DOSTERT, LEON E., "The Georgetown Institute Language Program", PMLA, 68, (1953), pp. 2-13.

DOSTERT, LEON E., Report of the Second Annual Round Table on Linguistics and Languages, Institute of Langanges and Linguistics, Georgetown University, Washington, D.C. (1951).

DOYLE, H.G. et al, Handbook on the Teaching of Spanish and Portuguese, New York-Boston, D.C. Heath, (1945), pp. 290-295.

DUCRETET, P., "Lang Lab. Programming", Canadian Modern Language Review, 8, (1962), pp. 12-15.

DUNKEL, HAROLD B., "If you're Buying a Recording Machine", MLJ, 31, (1947), pp. 253-260.

DUNLOP, IAN, "Television English", English Language Teaching, 16, (1961), pp. 44-51.

EASLING, KATHLEEN A., A Study of Foreign Language Programs in Campus Laboratory Schools", Ph.D. dissertation,Ohio State University (1957).

EBELKE, JOHN F., "An Experiment with Recording and Play-back Machines in Academic FL Teaching", Modern Language Journal, 28, (1944), pp. 589-595.

EDDY, FREDERICK D., "The Language Studio,"Modern Language Journal, 28, (1944), pp. 338-341.

EDDY, FREDERICK D., "The New York Materials Development Center and the Glastonbury Materials", and NAJAM, EDWARD W., "Materials and Techniques for the LL", Rep. 2nd LL Conference 23-25/3/1961, IJAL, 28 (1962) pp.34-39.

EDDY, FREDERICK D., "The Secondary School Lang. Lab: Some Observations on Present Practice and Long Range Possibilities", Northeast Conference on the Teaching of Foreign Languages 1956 Report, Yale Univ., New Haven, Connecticut Nelson Brooks Materials Program.

EDLING, JACK V., "Reports on the Keating Report", The American School and University, 36, (1963), pp. 33-38.

EICHOLZ, ERICH, "Function and Equipment of a Language Lab.", Modern Language Journal, 37, (1953), pp. 181-184.

ENGELS, L., "Heeft het taallaboratorium kans in Belgie aanvaard te worden?", Tijdschrift voor Opvoedkunde, 5, (1959-1960) pp. 108-119.

ESTARELLAS, JUAN and REGAN, TIMOTHY F., "Tomorrow's Language Lab. Today", The Florida FL Reporter, 4, (1965-1966), pp. 3-4.

F. F. "Varia, que penser du laboratoire de langues?", Revue des Langues Vivantes, 28 (1962), pp. 273-277.

FABRIZI, B., "How's, why's and where's of Lang. Labs.", The Nation's Schools, 65 (1960), pp. 58-60+.

FABRIZI, BENEDETTO, "Language Laboratory Logic", Bay State Foreign Language Bulletin, 9, (1963), pp. 20-22.

FELT, W., "Radio and the Foreign Language Lab.", French Review, 34 (1961), pp. 562-6.

FERRELL, JAMES O., "An Experiment in the Use of Drill Instruction in Language Laboratories", Language Learning, 7, (1956-1957), pp. 59-64.

FIERROS, M., "Spanish with a Tape Recorder and Ten Earphones", Hispania, 43 (1960), pp. 498-9.

FIFE, AUSTIN E., and NIELSEN, MARION L., "Conference on Neglected Languages: A Report", Modern Language Association of America, pp. 179-186.

FINCH, RICHARD and LAURITS, JAMES, "Notes on a Pilot Laboratory", California Journal of Secondary Education, 34 (1959), pp. 61-4.

FITZGERALD, THOMAS R., "The Georgetown Latin Project", Jesuit Educational Quarterly, 20, (1957/8), p. 113.

FITZGERALD, THOMAS R., "A Reply to the Query", Jesuit Educational Quarterly, 20, (1957/8), p. 204.

FITZGERALD, PAUL A., "Research versus Teaching", Jesuit Educational Quarterly, 23, (1960/1), p. 197.

FOTOS, JOHN T., "The Purdue Laboratory Method of Teaching Beginning French Courses", MLJ, 39, (1955), pp. 141-143.

FOX, J. D. "The 'Do-it-yourself' Lang. Lab.", Modern Languages, 44, (1963), pp. 156-8.

FRANK, JOHN G., "Language Learning with the Tape that Talks Back", Modern Language Journal, 35 (1951), pp. 616-8.

FRASER, R., "Teacher or Technician", Wayland High School typscrips 3pp.

FREUDENSTEIN REINHOLD, "Stand und Entwicklung der language Laboratories in den Vereinigten Staaten," Die Neueren Sprachen, (1961).

FREUDENSTEIN, REINHOLD,"Hat das Sprachlabor eine Zukunft im Deutschen Gymnasium?", Die Neueren Sprachen, (1961).

FREY, J. WILLIAM, "You Too Can Have a Language Laboratory", Camden, N.J., Radio Corporation of America, (1958), pp. 15.

FRIEDL, BERTHOLD, C., "Improved Teaching Techniques in Russia, MLJ, 38, (1954), pp. 290-294.

FRIEDMANN, H., "Language Laboratories: Some Conceptions and Misconceptions", Babel, 25 (1964).

FRIEDMANN.,H., "Language Laboratories, Some Conceptions and Misconceptions", *Technical Education and Industrial Training*, 5, (1963), P. 1.

FRIEDMANN, H., "The Teaching of Modern Languages by the C.R.E.D.I.F. Audio-visual Method", *Incorporated Linguistic*, 1, (1962), pp. 72-77.

FRIEDRICH, IRIS (Nee Wilcock), "Language Laboratories in the USA", *Babel*, 9, (1958).

FRY, EDWARD, "Research Tools: Instrumentation in Educational Research: Lang. Labs.", *Review of Educational Research*, 30 (1960), pp. 513-521.

FULTON, RENEE J., "Language Laboratory Develops the Listening Ear", *Modern Language Journal*, 43, (1959), pp. 224-5.

FUNKE, ERICH, "Rebuilding a Practical Phonetics Laboratory", *German Quarterly*, 21, (1949), pp. 120-125.

GAARDER, A. BRUCE, and HUTCHINSON, JOSEPH C., "Brief Analysis of the Keating Report", U.S. Office of Education, Washington 25, D.C., (1963).

GAARDER, A. BRUCE, "Foreign Language Laboratory Techniques", *News Letter*, (1956), pp. 21.

GAARDER, A. BRUCE, "Lang. Lab. Techniques: The Teacher and The Lang. Lab.", *Language Teaching Today USA*, 26 (1960), pp. 41-50.

GALAS, EVANGELINE: CADOUX, REMUNDA: SISTER MARGARET PAULINE: SERAFINO, ROBERT: SCHUELER, HERBERT, "The Transition to the Classroom", *Northeast Conference on the Teaching of FLs* (1961), pp. 43-51.

GARIMALDI, COLETTE, "Correlating the LL with the Classroom", NAJAM, EDWARD E., "Materials and Techniques for the LL, Report of the 2nd LL Conference 23-25/3/1961, *IJAL*, pp. 31-33.

GAUDIN, LOIS, "The Language Laboratory", *French Review*, (1952), pp. 285-6.

GAUDIN, LOIS S., "The Language Laboratory and Advanced Work", *The Modern Language Journal*, 46, (1962), pp. 79-81.

GAUDIN, LOIS F., "Teaching the Teacher with Teaching Aids", *French Review*, 31 (1957), pp. 47-51.

GAUERKE, HERBERT, J., and CARDEW, ANGELIKA K., "Teacher Training Via TV. An Experiment", *The Modern Language Journal*, 47, (1963), pp. 69-70.

GAUVENET, HELENE, "Les Moyens Audio-Visuels: le Disque et l'enseignement du Francais aux Etrangers", *Le Francais dans le Monde*, 1, (1961).

GIANNETTI, G., "Lang Lab. in a Mod. Curriculum", *American Teacher Magazine*, 44, (1959), pp. 7-8+.

GIANNETTI, G., "Lang. Teacher & The Lab.", *American Teacher Magazine*, 45, (1961), pp. 11-2.

GIBSON, ROMAIN, "Can Tapes Teach?", Educational Screen, (1958), pp.180-181.

GIBSON, MRS. R. E. "Final Report on the Westside High School Teaching by Tape Project", Nassp Bulletin, 44 (1960), pp. 56-62.

GIBSON, ROMAIN (MRS. RODNEY E.), "Tape Recordings Experiment Is Expanded in Westside Junior and Senior High Schools, Omaha, Nebraska", NASSP Bulletin, 43, (1959), 49-72.

GLASER, ROBERT, "Comments on the Use of Teaching Machine Techniques in the Language Laboratory", Language Teaching Today (ed. OINAS, F.J.), 14, (1960).

GILBERT, ZENOBIA, "The Duties of the Language Laboratory", MLJ, 47, (1963), pp. 332-333.

GODING, STOWELL C., "Closed Circuit Television and Videotapes in FL Teacher Training at the University of Massachusetts"Department of Romance Languages, University of Massachusetts, MLA Conference 29, (1965).

GODING, STOWELL, C., "University of Massachusetts Project for More Effective Foreign Lang. Instr.", MLJ, 42 (1958) p.105, (1953) PP. 72-75.

GORDON, BRUCE R., "Integration of Laboratory and Classroom", MLJ, 37,(1953), pp. 72-75.

GOUREVITCH, D. J. "Lab Techniques and Teaching", The French Review, 33, (1959), 166-70.

GRADISNIK, ANTHONY J., "A Trial Program in Spanish for the Fifth and Sixth Grades using Instructional Television", The Milwaukee Public Schools, 5225 West VlietStreet, Milwaukee 8, Wis. (1962), 44 pages.

GRAVIT, FRANCIS W., "Some Techniques in Lab. Teaching", French Review, 30, pp. 149-154.

GRAVIT, FRANCIS W., and VALDMAN, ALBERT, "Structural Drill and the Language Laboratory", International Journal of American Linguistics, 29 (1963) 2, publ. 27 of the Indiana Uni. Research Center in Anthropology,Folklore, and linguistics ix + 224 pp. Report of the 3rd Lang. Lab. Conference held at Indiana University, March 29-31,1962.

GRIMALDI, WILLIAM M., and MUSURILLO, HERBERT A., "The Georgetown Latin Project: A Query", Jesuit Educational Quarterly, 20, (1957/8), p. 199.

GRITTNER, FRANK M., "The Language Lab-Gadget or Godsend?", Wisconsin Journal of Education, 115, (1963), pp. 15-16.

GRITTNER, F.M., "Language Labs in Wisconsin: Specifications and Utilization", Voice of the Wisconsin Foreign Language Teacher, (1962) 49 pages.

GRITTNER, FRANK, M, "Mod. FL Study in our Schools", Wisconsin Journal of Education, 93, (1961), pp. 8-9.

GRITTNER, FRANK M., "Pattern Drills: How to Use Them in the Classroom and the Lab", Voice of the Wisconsin Foreign Language Teacher, (1962), pp. 33-36.

GRITTNER, FRANK, "Shortcomings of Language Laboratory Findings in the Iar-Research Bulletin", MLJ, 48, (1964), pp. 207-210.

HABER, R.N. "Spread of an Innovation: High School Language Laboratories", J.Exp. Ed., 31, (1963), pp. 359-369.

HALLMAN, CLEMENS L; MIKESELL, NORMAN; and BLICKENSTAFF, CHANNING, "Language Laboratory Standards and Specifications", Indiana State Department of Public Instruction, 227 State House, Indianapolis, Indiana, (1964).

HAM, EDWARD B., "Le Laboratoire Linguistique - Actif et Passif", Les Conferences de l'Institut Franco-Americain de Bowdoin College, (1961) pp. 20-28.

HANLEY, B. T. "Foreign Language Tapes", Il Ed. Screen, 39, (1960), pp. 174-5.

HANNAN, DENNIS G., "Common Sense and the Direct Method of Language Teaching", Phi Delta Kappan, 47, (1966), pp. 359-360.

HANSON, BLAIR, "A Mobile Laboratory", MLJ, 42, (1958), pp. 18-19.

HANWAY, W., "The Development of Language Laboratories", Radio, Television and Hobbies, (1964), pp. 4-5.

HARDIE, ELAIN M., "Helps Speaking Practice", The Christian Science Monitor, (1962), p.11.

HARRIS, C. CLELAND, "The Use of Mechanical Aids in the Language Program of L.S.U.", Hispania, 32, (1949), pp. 20-26.

HARTLEY, KATHLEEN, "Language Lab. on Wheels", Where, No.16.

HARTSOOK, JOHN H., The Function and Techniques of the Foreign Language Laboratory', Camden, N.J. Radio Corporation of America, (1958), p. 19.

HARVEY, HOWARD G., "A French Language Laboratory in Four Levels", FR, 29, (1955), pp. 140-149.

HARVEY, HOWARD G., "From Language Laboratory to Television Studio", MLJ, 38, (1954), pp. 282-290.

HARVIGURST, ROBERT, J., "Aids to Language Study," School and Society, 69, (1949), p. 444.

HAYES, ALFRED S., "Language Laboratory Facilities. New Media for Instruction 4", Bulletin OE-21024 No. 37 (1963).

HAYES, ALFRED S., "Notes on Current Research", Elton Hocking, pp. 60-77.

HAYES, ALFRED S., "Problems of the Language Laboratory", Monograph series on Linguistics and Language Teaching No. 2, Georgetown Uni. Press, S (1952).

HAYES, ALFRED. S. , "Procedures for Language Lab. Planning", National Association Secondary School Principals Bulletin, 46 (1962), pp. 123-35.

HAYES, ALFRED S., "Step-by-Step Procedures for Language Laboratory Planning", University of Michigan Publications of the Language Laboratory, 5, (1961), pp. 96-108.

HAYES, ALFRED S., "What is a Language Laboratory?", Saturday Review, (1963), 70-71.

HAYMAN, JOHN L. JR., "Results of the First Year's Research in the Denver-Stanford Project", Stanford University, Stanford, Calif. and James T. Johnson, Jr., Denver Public Schools, Denver, Colo., Research Office,1261 Glenarm Pl., Denver, Colo, (1962).

HEATH, DOUGLAS L., *A Language Laboratory Handbook: How to Plan, Build and Operate a Modern Language Laboratory*, Boyds, Maryland, The Language Center, (1954), pp. 52.

HILL, LESLIE A., "The Ceto 'English for Everyone' Series", *English Language Teaching*, 19, (1965), pp. 164-167.

HILTON, J. B. "The LL in the Grammar School", *Visual Education*, (1963), pp. 2-4.

HITEN, EDITH and MIJUS-PERREAL, RENEE, "La Bande Sonore", *The French Review*, 37, (1964), pp. 675-682.

HOCKING, ELTON, *Audio-Visual Instruction*, (1959), p. 208.

HOCKING, ELTON, *Comparative Effectiveness of Language Laboratory Equipment*, (1960-1961).

HOCKING, ELTON, "The Decade Ahead", *MLJ*, (1964), 48, pp. 3-6.

HOCKING, ELTON, "Experimentation at Purdue University", and NAJAM, EDWARD W., "Materials and Techniques in the LL", Rep. 2nd LL Conference 23-25/3/1961, *IJAL* 28 (1962), pp. 80-91.

HOCKING, ELTON, "It'sTime to Join Forces", *Audio-Visual Instruction*, (1962).

HOCKING, ELTON, "The Lang. Lab.", *College and University Business* (1957).

HOCKING, ELTON, "Language Laboratories", *The Nation's Schools*, (1961), 67, pp. 83-86.

HOCKING, ELTON, "Language Laboratory and Language Learning", *Purdue University, Dept. of Audiovisual Instruction*, (1964), 212 pages.

HOCKING, ELTON, "Lang. Labs. - Exp. with Lang. Labs. establishes the need for good supervision and sustained enthusiasm. Here's how to plan, what to expect", *The Nation's Schools*, (1961), pp. 4.

HOCKING, ELTON, "Methods and Techniques in Transition", *French Review*, 35, (1962), pp. 396-401.

HOCKING, ELTON, "New Facilities at Purdue - Where Lang. Learning is audio-visual-lingual", *Audio-Visual Instruction*, (1961).

HOCKING, ELTON, "The Power of Babel", *MLJ*, 36, (1952), pp. 239-241.

HOCKING, ELTON, "The Purdue Language Program", *PMLA*, 70, (1955), pp. 36-45.

HOCKING, ELTON and JENSEN, GRANT W., "What are some new developments in functional mod FL teaching?", *National Association of Secondary School Principals Bulletin*, 44 (19600, pp. 16-18.

HOCKING, ELTON, and McKINNEY, JAMES, "Modern Lang. Class", *National Education Association Journal*, 47, (1958), pp. 182-4.

HOCKING, ELTON and MERCHANT, ROBERT C., "The Fabulous Language Labs"., *Educational Screen and Audio-Visual Guide*, 38 (1959), pp. 184-7.

HOCKING, ELTON, and MERCHANT, ROBERT S., "How Five Schools use For. Lang. Labs.", *School Management*, (1959), pp. 38-77.

HODDER, J., "Des generaux retournedt en classe a l'ecole des langues du Shape", Taalonderwijs, 6, (1962), pp. 48-59.

HOGE, HENRY W., "Shop-Talk: The Language Laboratory: Methods and Materials ", Hispania, 37, (1955), pp. 70-72.

HOGE, H. W. "Testing in the Lang. Lab.: A Lab. Experiment in Spanish Pronunciation", Hispania, 42 (1959), pp. 147-52.

HOK, RUTH, "Testing Teacher Trainees by Means of Closed-Circuit Television and MLA Film No. 5", Language Learning, 14, (1964), pp. 55-59.

HORVAY, FRANK D., "Television in the Service of Fles Teacher Training", Heidelberg College, Tiffin,Ohio 44883, Conference 29, (1965), 5 pages.

HOY, P. H. "Current Tendencies in the Teaching of Modern Languages", Babel, 23 (1963), pp. 3-9.

HUEBENER, THEODORE, "Audio-visual Aids in High School", Modern Language Journal, 43, (1959), pp. 266-7.

HUEBENER, THEODORE, "Audio-visual techniques in Teaching FLs: A Practical Handbook", NYUP, (1960), pp. 163.

HUEBENER, THEODORE, "Can FL Discs be used successfully in High School Classes?", MLJ, (1947), pp. 343-347.

HUEBENER, THEODORE, "FL Lab.", Journal of Educational Sociology, 33 (1960), pp. 212-13.

HUGHES, JOHN P., Language Laboratory , Camden, N.J. Radio Corporation of America. (1958).

HUGHES. J. P. "The Machine Age in Language Teaching", Catholic School Journal, 58 (1958), pp. 63-8+.

HUGHES, JOHN P., The Science of Language, an Introduction to Linguistics, N.Y. Random House (1962)

HURLEY, WILLIAM; CERESA, ALDO; SONGER, ADA; PACOTTI, LOUISE; CLAWSON, AILEEN; CHRISMAN, BYRON, "Team Teaching and use of Recorders in Taylorville Senior High School", NASSP Bulletin, 44 (1960), pp. 268-274.

HUTCHINSON, JOSEPH C., "The Language Laboratory", Office of Education OE-27013 Bulletin No. 23, (1961), pp. 85.

HUTCHINSON, JOSEPH C., "The Language Laboratory, How Effective Is It?", School Life, 46, (1964), pp. 39-41.

HUTCHINSON, JOSEPH C., "Languages through listening", Il Sch. Life, 42, (1960), pp. 16-19.

HUTCHINSON, JOSEPH C., "Mass oral testing by remote control", Hispania, 42 (1959), pp. 466-470.

HUTCHINSON, JOSEPH C., "Modern Foreign Languages in High School", Office of Education Bulletin No. 23, (1961), pp.85.

HUTCHINSON, JOSEPH C., "The National Situation in the Field of Language Laboratories", International Journal of American Linguistics, 26 (1960), pp. 3-13.

HUTCHINSON, JOSEPH C., "Planning for LL Facilities", and NAJAM EDWARD W., "Materials and Techniques in the LL", Rep. 2nd LL Conference 23-25/3/1961, *IJAL*, 28 (1962), pp. 117-123.

HUTCHINSON, JOSEPH C., and PUTNAM, E. A. , "Excerpts from Tentative Lang. Lab. Vocab. in Spanish", *Hispania*, 43 (1960), 657-8.

HYER, ANNA L., "A New Team, The Language Teacher and the AV Co-ordinator", and NAJAM, EDWARD, E., "Materials and Techniques for the LL", Report 2nd LL Conference 23-25/3/1961, *IJAL*, 28 (1962), pp. 27-30.

INGRAM, S., and DARLINGTON J., "Audio-visual aids in Language Teaching", *Visual Education*, (1963), pp. 34-37.

INGRAM S., and MACE J., "Audio-visual French. Second Year", *Modern Languages Eng.*, 41 (1960), pp. 123-134.

IODICE, DON. R. "Creating Interest in Lang. Labs.",*FRench Review*, 33 (1960), pp. 268-71.

IODICE, DON R., "Guidelines to Language Teaching in the Classroom and Laboratory", *University of Hawaii, Honolulu, Hawaii*, (1961), pp. 1-60. (Published by Electronic Teaching Laboratories, Washington, D.C.)

JACKSON, DAVID M; CHANGSON, PAULINE E; BROWN, ROGER; WESTMEYER, PAUL; SHOEMAKER, W. L. "Five projects designed to increase Students' Independence in Learning, University of Illinois High School", *NASSP Bulletin*, 44 (1960), pp. 290-304.

JENSEN, B., "An Independent Study Laboratory using Self-scoring Tests", *Journal of Educational Research*, 43 (1949), pp. 134-137.

KEELER, SISTER JEROME, "A Post-War Experiment in Teaching First Year French", *FR*, 21, (1948), pp. 313-316.

JOHNSON, ROBERT, B., "A Workable French Laboratory Program at Low Cost", *FR*, 25, (1952), pp. 199-206.

JOHNSON, YVON. O. "True Audio Reproduction", *Educational Screen*, 38, (1959), pp. 592-3.

JOHNSTON, MARJORIE, CECIL, "How to Plan a Lang. Lab.", *The Nation's Schools*, 63, (1959), pp. 102-106.

JOHNSTON, MARJORIE C., and SEERLEY, CATHERINE C., "The FL Lab.", *School Life*, (1958), pp. 12-13.

JOHNSTON, MARJORIE CECIL, and SEERLEY, CATHERINE C., "Foreign Language Laboratories in Schools and Colleges", *US Dept. of Health, Education & Welfare Bulletin*, 3 (1959), pp. 86.

JOHNSTONE, MARJORIE and SEERLEY, CATHERINE C., *Survey of Foreign Language Laboratories in Secondary Schools and Institutions of Higher Education* , US Dept. of Health, Education & Welfare, Circular No. 524, (1958).

JOLIAT, EUGENE, "The Use of Machines in the Teaching of French", *Canadian Modern Language Review*, 8, (1952), pp. 5-6.

KING, PAUL E., Language Teaching Comes of Age, Magnetic Recording Industries, (1958).

KING, PAUL, E., "Lang. Teaching Comes of Age", Symposium on FLs and the National Interest, (1958), pp. 11.

KING, PAUL E., "Man and Machines in Language Teaching", International A-V Technical Centre, pp. 17.

KING, P.E., "Man and Machines in Language Teaching", Teachers' Coll. Rec., 65, (1964), pp. 430-435.

KING, PAUL. E., "Now: Labs for Lang. Teaching", School Executive, 78 (1959), pp. 54-6.

KING, PAUL E., "Programming Guide for the Electronic Classroom, Modern Foreign Languages, pp.10.

KING, PAUL E., "Section 'Techniques' (use of materials)", International A-V Tech. Centre,

KING, PAUL E., Study on Modern Language Laboratories, Majestic Recording Industries (1955).

KING, PAUL. E., "Teaching Machines and Lang. Lab.", American School Board Journal, 141 (1960), pp. 17-18+.

KNIGHT, A., "Latin and the Lang. Lab.", Classical Journal, 56 (1960), p.65.

KOEKKOEK, BYRON J., "The Advent of the Language Laboratory", MLJ, 43, (1959), pp. 4-5.

KONE, ELLIOT H. (ed.), "Language Laboratories - Modern Techniques in Teaching Foreign Languages", Bulletin of the Connecticut Audio-Visual Education Asscn., 19, (1959), pp.190.

KOON, CLINE M., "School Use of Visual Aids: An Interpretative Study", Office of Education Bulletin No.4 (1938).

LALEIKE, FRED. H., "West Bend Stirs interest in Lang. Study", Wisconsin Journal of Education, 93, (1961), pp. 20-21.

LAMERAND, RAYMOND JEAN, "The Language Lab. and the Study of Literature", Babel, 2, (1966), pp. 22-25.

LAND, HARLAN, L., "Specifications for Auditory Discrimination Learning in the Language Lab.", in Gravit & Valdman (eds.), Structural Drills in the LL, IJAL, 29 (1963),

LARSEN,HENNING, "FL Study: An Old Pioneer on a New Frontier", and NAJAM, EDWARD W., "Materials and Techniques for the LL", Report of the 2nd LL Conference, (1961), IJAL, 28,(1962), pp.16-24.

LAWLOR, JOSEPH P., "Lang. Lab.", Illinois Education, 47 (1958), pp.136-8.

LEBEL, C. J. "How to Make Good Tape Recordings", Audio Devices Inc. (1956).

LEO, BROTHER, "Lab. Work Promotes Lang. Fluency", The Catholic School Journal 60, (1960), p.13.

JONES, H. A. and HAY, MICHAEL, "The Liberal Approach in a Large Centre", and LOWE, MARGARET & JOHN (eds.), "On Teaching FLs to Adults", Pergamon, (1965), pp. 69-85.

JOSLOW, DAVID L., "Language Learning Equipment in the Secondary School Language Laboratory: Its Function, Use, and Minimum Specifications", Proceedings of the First Conference on the Role of the Language Laboratory in the Secondary School, (1960), pp. 39-58.

KAY, J.A. and KING, PAUL E., Language Laboratory Planning, What Kind?, How Much? New York, Magnetic Recording Industries, (1958), pp..12.

KAY, JACK, Laboratory Planning, What Kind?', Magnetic Recording Industries , (1959).

KEATING, RAYMOND F., "A Study of the Effectiveness of the Language Laboratories", Institute of Administrative Research Columbia University, (1963), pp. 60.

KEATING, R.F., "Reports on the Keating Report, Review of A Study of the Effectiveness of Language Laboratories", Am. Sch. & Univ., 36, (1963), pp. 33-5+.

KEATING, RAYMOND F., "A Study of the Effectiveness of Language Laboratories", The Inst. of Admin. Research, Columbia University, (1963), pp. 61.

KEETON, KENNETH E., "A Suggestion for the Preparation of Language Laboratory Tapes", MLJ, 45-5, (1961), pp. 225-26.

KIESER, W.E., "On Tape Recorders and Language Laboratories", The Canadian Modern Language Review, 20, (1964),

KELLER, JEAN PAUL, "The Language Laboratory, Tool or Toy", Hispania, 35, (1952), pp. 189-194.

KERR, RICHARD, H. "Language Lab? No, not for Me!", New York State Education, 48 (1961), P.13.

KIDDLE, LAURENCE B., "The Laboratory of the Dept. of Romance Langs. at Michigan", Language Learning, 2, (1949), p. 121.

KILKER, JAMES A., "Uses and Abuses of the Lang. Lab.", The Catholic School Journal, 64, (1964), pp. 53-54.

KING, PAUL E., "Audio Electronics and Programmed Instruction", Education, 123 (1964), pp. 159-160, 167.

KING, PAUL E., "Capabilities and Limitations of Audio-electronics in Education", Audio Engineering Society's Session, (1962).

KING, PAUL E., TheContinuing Study on Language Laboratories, Magnetic Recording Industries, (1958).

KING, PAUL E., The High School Language Laboratory, Specific Considerations, New York,(1958), 8 pp.

KING PAUL, E., The High School Lang. Lab. - Specific Considerations, Magnetic Recording Industries, (1954).

LEON, PIERRE, R. "Laboratoire de Langue et Correction Phonetique Essai Methodique", *Didier*, (1962), pp.275.

LEON, PIERRE ROGER, "Methodologie de l'Orthophonie au Laboratoire de Langues ", Unpublished Doctorat de l'Universite dissertation, University of Besancon, (1960).

LEWIS, RICHARD B., "The Tape Recorder goes to College", *Educational Screen*, 32, (1953), pp.158-9, 170.

LIND, MELVA, "On Language Laboratories", *FR*, 21, (1948), pp. 320-323.

LLASERA, JEAN, "The Saine-Cloud Method", LOWE, MARGARET & JOHN (eds.), *On Teaching FLs to Adults* (1965), pp.36-52.

LLOYD, DONALD J., "Language in a Living Envoironment. Wayne develops a new Concept", *Audio-Visual Instruction*, (1958).

LLOYD, DONALD J., "The NDEA Grant to the Mod. Lang. Audio-Visual Project", *Bay State Bulletin*, (1959), pp. 4-7.

LOCKE, WM. N., "Advice for the Lab-Lorn", *Bay State FL Bulletin*, (1958).

LOCKE, WILLIAM N., "Equipment for the Language Laboratory", *International Journal of American Linguistics*, 26 (1960), pp. 25-40.- Oinas (ed.).

LOCKE, WILLIAM N., "The Future of Language Laboratories", *The Modern Language Journal*, 49, (1965), pp. 294-304.

LOCKE, WILLIAM N., "Ideal Language Laboratory Equipment", *MLJ*, 43, (1959), pp. 16-18.

LOCKE, WILLIAM N., "To Record or Not", *MLJ*, 24, (1960), pp. 278-279.

LOGAN, GERALD, E., "Observations about the High School Lab"., *The German Quarterly*, 35 (1962), pp. 309-17.

LORGE, SARAH, W., "Evaluative Look at FL Labs"., *Journal of Educational Sociology*, 33, (1960), pp. 229-33.

MC DONNELL, CORNELIUS, "Lang. Lab. in the Grade School & in Coll"., *The Catholic School Journal*, 61, (1961), p. 29.

MC DOUGAL R., "The Development of a Language Laboratory for More Effective Second Language Teaching", *Teachers College Journal*, 28, (1957), pp. 98-101.

MC GREW, M.B., *The Human Factor in the Language Laboratory*, New York, Magnetic Recording Industries, (1958).

MC GRAW, MYRTLE B., "Modern FLs, Learning to Speak through Listening", *Curriculum and Materials*, (1958), p.12.

MC GRAW, MYRTLE, B., "The Role of the Teacher and Student in the Electronic World", *MLJ*, 43, (1959), pp. 218-220.

MC KAY, B, and EICHHOLZ, E., "Foreign Language Laboratory", *Kentucky School Journal*, 40 (1961), pp. 17-19.

MC PHEE, KATHLEEN, "Miracle or Monster? Thoughts on the use of the Language Machine in Australia", Babel, 25, (1964), pp. 11-15.

MC VICKERS, CECIL DON, "Language Laboratory at Cottey", MLJ, 39, (1955), pp. 82-84.

MALECOT, ANDRE, "Techniques and Equipment for the Lang. Lab. at the University of California at Riverside", Modern Language Forum, 40, (1955), pp.113-122.

MALECOT, ANDRE, "Types of Aduio Equipment for the Language Laboratory", Modern Language Forum, 42, (1957), pp. 60-65.

MALLERY, DAVID, "The New Dimension in Foreign Language Teaching: A Message to the School Head about the Language Laboratory", National Council of Independent Schools, (1961), p. 32.

MALLINA, R.F., Efficiency and Costs of Educational Electronics, New York, Magnetic Recording Industries, (1958).

MARSHALL, ROBERT, Your Tape Recorder, New York, Greenberg, (1955).

MARTIN, HAROLD F., "Positive results reported from the Language Labs"., Pa. Sch. J., 3, (1963), pp. 212-213.

MARTLAND, T. H. "Have you Considered Multi-Purpose Lang. Labs."., School Managements, (1961), pp. 86-7+.

MARTY, FERNAND L., "Lang. Lab. - Methods and Techniques", Language Teaching Today, 26, (1960), pp. 51-71.

MARTY, FERNAND L., "The various Types of Language Laboratory Installations", Language Laboratory Learning, (1960), 5 pp.

MARTY, FERNAND, "Language Lab. Techniques", Educational Screen, (1956), pp. 52-53.

MARTY, FERNAND, Methods and Equipment for the Language Lab., Middlebury, 2nd ed. (1956), pp. 84.

MARTY, FERNAND, Spoken and Written French for the Language Lab., Middlebury Vt., (1957).

MARTY, FERNAND, L., "Using the Lang. Lab."., Educational Screen, 37,(1958), pp. 176-7.

MATHEWSON, FRANKLIN T., "A Realistic Starter Lab.," Overview, (1961), pp.71-72.

MATHIEU, GUSTAVE, "A Suggestion for Advanced Lab"., The German Quarterly, (1961), pp. 140-145.

MATHIEU, GUSTAVE, "Brief Guide to Sound Labmanship", MLJ, 44 (1960), pp. 123-6.

MATHIEU, G., "The Case for Tapes without Pauses", MLJ, 49, (1965),

MATHIEU, GUSTAVE, "Choral Pattern Drills", MLJ, 45, (1961), pp. 215-6.

MATHIEU, GUSTAVE, "Exploiting the Potosi of Commercial Language Recordings", Hispania, (1961), pp. 585-587.

MATHIEU G., and HOLTON, JAMES S., "A Guide to Sound Labmanship", Sound Language Teaching, (1961), pp. 134-74.

MATHIEU, GUSTAVE, "Have a Language Laboratory: What Now?", Magnetic Recordings Industries, (1959).

MATHIEU, GUSTAVE, "Lab. Program in German at Pomona Coll"., The German Quarterly, 33, (1960), pp. 240-5.

MATHIEU, G., "Language Laboratories", Review of Educational Research, 32, (1962), pp. 168-178.

MATHIEU, GUSTAVE, "Lang. Labs: Mechanical Monsters or Push-button Miracles" California Teachers' Association Journal, 56, (1960), pp. 8-10.

MATHIEU, G., "Pause Control: A Device for Self-Facing in the Lang. Lab.", Audiovisual Instruction, (1964), p. 352.

MATHIEU, G., "The Pause Lever, Key to Self-Pacing", The German Quarterly, 35, (1962), pp. 318-321.

MATHIEU, G., "Recommendations of the Learning which should occur in the Lang. Lab. and in the Classroom", University of Michigan Publications of the Lang. Lab., 5, (1961), pp. 53-95.

MATHIEU, G., "Second Language Means a Second Sight", Exceptional Children, 27, (1961), pp. 269-73,

MATHIEU, GUSTAVE, "Sound Teaching have Lang. Lab.: What Now?", Educational Electronics Division, (1959).

MATHIEU, GUSTAVE and HOLTON, JAMES S., dir. by O'ROURKE, EVERETT, V., "Suggestions for teaching Foreign Languages by the Audio-lingual method: a Manual for Teachers", Bulletin of the California State Dept. of Education, 29, (1960), pp. vii +.27, and excerpts in Education Digest, 26 (1961), pp.14-15.

MATLUCK, JOSEPH H., "Modified lab. Library System", MLJ, 45, (1961), pp.267-8.

MATLUCK, JOSEPH H., "Notes on the "Modified" Lab. Library System", MLJ, 47, (1963), pp. 20-22.

MAYNES, J. O. JR., "Experiment to gauge the Effectiveness of the Audio-lingual Method and the Lang. Lab.", Hispania, 45 (1962), pp.377-82.

MAYO, HELEN, N., "Class, Laboratory, and Credit Hours in Beginning Modern Languages", MLJ, 47, (1963), pp. 23-25.

MAZZARA, RICHARD, "Now that We have a Lang. Lab., what do we do with it?", French Review, 32, (1959), pp. 562-5.

MENZE, EDWAIN F., "The Magnetic Tape in the Elementary German Listenting Program", German Quarterly, 27, (1955), pp. 270-274.

MERRILL, RICHARD D., "The Foreign Lang. Lab. Some Observations", Hispania, 41, (1958), pp. 135-138.

MICHAISKI, A., "Lang. Lab. and Lang. Learning", Hispania, 45 (1962), pp.175-9.

MIKESELL, NORMAL L., "Developing the Recorded Materials Library", SDLL, (1963), pp. 195-206.

MIKESELL, NORMAN L, and MILLER, ROBERT A., "Language Lab. and Audio Learning Center of the Indiana University", International A-V Technical Centre, Col. 63, WD 5/7, 4 pages.

MILDENBERGER, KENNETH W., "Independent Evaluation of the Lang. Institute Program for the Summer of 1960", Bulletin of National Defence Education Act Public Law, 85-864.

MILDENBERGER, KENNETH W., "Problems, Perspectives and Projections", and NAJAM, EDWARD W., "Materials and Techniques in the LL", Rep. 2nd LL Conference 23-25/3/1961, IJAL, 28 (1962), pp. 168-172.

MILLER, MINNIE MAE, "Spanish in the Laboratory School", Hispania, 34, (1951), pp. 95-96.

MITCHELL, B., "Audio-visual Method of Teaching French", Babel, 22, (1963), pp. 11-15.

MOORE, J., "Army Language School: An Evaluation", MLJ, 41, (1957), pp.332-337.

MOORE, P., "Language Lab. Experiment in the Junior High School", MLJ, 46, (1962), pp. 269-71.

MORRIS, G. E. "Language Classroom Lab."., Nat.Cath. Ed. Assn.Bul. , 58, (1961), pp. 274-6.

MORRIS, S., "Foreign Languages", Educational Review, 16, (1964), pp. 83-91.

MORTON, F. RAND, "Foreign Lang. Program and the Lang. Lab.", The Gwinn Curriculum Study, (1960), pp. 43-55.

MORTON, F. RAND, "Recent Developments in Lang. Lab. Equipment for Teaching and Research", Publications of the Language Laboratory, 5, (1961), pp. 1-24.

MOSKOWITZ, **GERTRUDE**, "TV Fles VS. Live Fles: A Study of Student Reactions", MLJ, 46, (1962), pp. 213-219.

MOSKOWITZ, GERTRUDE, -"TV versus Classroom instruction in Foreign Language: A Study of Elementary School Children's Attitudes", The Journal of Experimental Education, 33, (1964), pp. 175-181.

MOULTON, WILLIAM G., "What is Structural Drill?", SDLL, (1963), pp. 3-18.

MUELLER, THEODORE H., "Correlating the Lang. Lab. with the Textbook: Some Basic Considerations", in Gravit and Valdman's Structural Drills in the Lang. Lab. IJAL, 29 (1963), pp. 83-91.

MUELLER, THEODORE, "French by TV, The Teacher and the Machine", French Review, (1961), pp. 185-190.

MULLER, THEODORE, 'The Lang. Lab., Its Philosophy and Practices", Bay State Bulletin, (1959), pp. 7-13.

MUELLER, THEODORE, "New Trends in MFL Teaching", *Clearing House*, 34 (1960), pp. 271-4, same condensed *Education Digest*, 25 (1960), 49-51.

MUELLER, THEODORE, "Perception in FL Learning", *MLJ*, 42 (1958), pp.167-171.

MUELLER, THEODORE, "Psychology and the Lang. Arts", *School and Society*, 87, (1959), pp.420-428.

MUELLER, THEODORE, H., "Some Inferences about an Intensified Oral Approach to the Teaching of French Based on a Study of Course Drop-outs", *MLJ*, 48, (1964), pp. 91-94.

MUELLER, THEODORE, H., "La Structure de la Langue Francaise", *Wayne State University, Audio-Visual Utilization Center*, (1961).

MUELLER, THEODORE, "Teaching Concept in the Foreign Language Lab.".,
*The Journal of Teacher Education*, 12, (1961), pp. 317-21.

MUSTARD, HELEN, and TUDISCO, ANTHONY, "FL Lab. in Colls. & Unis.: A Partial survey of its Instructional Use", *MLJ*, (1959), pp. 332-40.

MYSHRALL, W. R. "Language Labs? Yes, for Everybody", *New York State Education*, 49, (1961), pp. 24-5.

NAJAM, EDWARD E. (ed.), "Overview of LL Situation in Materials and Techniques for the Lang. Lab.", *International Journal of American Linguistics*, 28, (1962), pp. 1-15.

NAJAM, EDWARD, W. (ed.), "Materials and Techniques for the Language Lab.", *International Journal of American Linguistics*, 21, (1962),.

NAJAM, EDWARD, W., "Over-view of the Lang. Lab. Situation", *International Journal of American Linguistics*, 28, (1962), pp. 1-15.

NASON, MARSHALL R., "Letter to Roger Wurtz on 'Advantages of Fidelipac Tape Cartridge' (or similar device)", *University of New Mexico, Institute for Secondary School Teachers of Spanish*, (1960), pp.2.

NEIDT, CHARLES O., and HEDLUND, DALVA, E., "Student Reaction to High School Language Laboratory Activities", *MLJ*, 49, (1965), pp. 471-475.

NEWBY, E. J. "Modified Lab. Library System", *MLJ*, 45, (1961), pp. 267-8.

NEWMAN, SAMUEL W., "The Language Lab. and the Electronic Classroom", *Hispania*, 48, (1965), pp. 102-104.

NEWMARK, MAXIM, "Teaching Materials: Textbooks, Audio-Visual Aids, The Language Laboratory", *Twentieth Century Modern Language Teaching*, (1947).

NOLFI, ANNA I., *A Blueprint for Language Laboratories*, 30 S. Goodman St., Apr. 4-A Rochester 7, New York.

NOVAK, R., "Recorders' Summaries of Workshops on Instructional Aids: Lang. Labs.", *Junior College Journal* 32, (1962), pp. 541-2.

OBERHELMAN, H. D. "Fl Lab. in Secondary Schools", *Hispania*, 43, (1960), pp. 145-8.

OBLUM, R., "How we use the Lang. Lab. at Greenwich High School", *The Journal of Educational Sociology*, 33, (1960), pp. 214-20.

OBLUM, RUDOPH, "How we use the LL at Greenwich HS", *J. Ed. Sociol.*, 33, (1960), pp. 214-220.

OBRECHT, DEAN H., "Plain Talk on the Tape Recorder",*MLJ*, 39, (1955), pp. 414-417.

OHANNESSIAN, SIRARPI, "English for Foreigners: Test Materials and Audio-Visual Aids", SDLL, (1963), pp. 73-82.

OLMO, GUILLERMO DEL; ATKINS, JEANNETTE; BASHOUR, DORA A; CAPRETZ, PIERRE; VAUGHAN, CLARK A., "Coordination between Classroom and Laboratory", *Northeast Conference on the Teaching of FLs*, Seymour L. Flaxman (ed.) Modern Language Teaching in School and College (1961), pp. 53-67.

O'NEAL, ROBERT, "For a New Look at Laboratory Planning", *The French Review*, 37, (1964), pp. 453-455.

O'NEIL, JAMES, "Men, Machines, and Conversation Courses", *French Review*, (1953), pp. 439-445.

ORWEN, GIFFORD, P., "Aid for the Language Lab.", *MLJ*, 46, (1962), pp. 39-40.

OTTO, CAROL, "Pupils at High School, Forsythe Can Dial a Language Lesson", *The Ann Arbor News*, (1962).

PAGE, J. L. "Films, Filmstrips, Recordings", *Grade Teach.*, 79, (1962), pp. 96-7+.

PEEBLES, SALLY, *The Phonetics Laboratory and its Usefulness*, Unpublished MA Thesis, University of Colorado, (1938), pp. 53.

PELORO, FILOMENA C., "From Verb Drill to Conversation", *SDLL*, (1963), pp. 45-54.

PIMSLEUR, PAUL, "Experimental Design in the Lang. Field", *Modern Language Forum*, 42, (1957), p.2.

PIMSLEUR, PAUL, "A French Speaking Proficiency Test", *French Review*, 34, (1961), p.5.

PIMSLEUR, PAUL, "The Functions of the Lang. Lab.", *MLJ*, 43, (1959), pp. 11-15.

PIMSLEUR, PAUL, "Le Laboratoire de Langues étrangères aux Etats-Unis", *International Review of Education*, 5, (1959), pp. 504-505.

PIMSLEUR, PAUL, "Machines and the Teaching of FLs USA", *Year Book of Education*, (1960), pp. 482-91.

PIMSLEUR, PAUL, "New Tests for a New Era", *Audio Visual Instruction*, 3, (1962).

PIMSLEUR, PAUL, "Pattern Drills in French", *French Review*, 33, (1960), p.6.

PIMSLEUR, PAUL; MACE, LARRY; KEISLAR, EVAN; "Preliminary Discrimination Training in the Teaching of French Pronunciation", *University of California Contract DHEW 8950*, (1961).

PLEASANTS, JEANNE VARNEY, "Language Laboratory Techniques", Northeast Conference on the Teaching of Foreign Languages, (1957), pp. 60-64.

PLEASANTS, JEANNE VARNEY, et al. "Report of the Committee on Teaching Aids and Techniques", Northeast Conference on the Teaching of Foreign Languages, (Ed. Germaine Bree), (1955), pp. 77-93.

POLITZER, ROBERT L., "Assiduity and Achievement", MLJ, 44, (1960), pp.14-16.

POLITZER, ROBERT L., "The Effective Use of the Structure Drill", The French Review, 38, (1965), pp. 674-680.

POND, K. S. "Language Teaching Tool: The Overhead Projector", MLJ, 47, (1963), pp. 30-3.

POPHAM, W. J. "Tape-recorded Lectures in the College Classroom", Audio-Visual Communication Review USA, 9. (1961), pp. 109-118.

PORTER, JOHN J., and PORTER, SALLY F., "A Critique of the Keating Report", MLJ, 48, (1964), pp. 195-197.

POSTON, LAWRENCE S., Jr., "The Place of the Laboratory in the NDEA Institutes", in Najam (ed.) Materials and Techniques in the LL, International Journal of American Linguistics, 28, (1962), pp. 150-154.

RAFFALLI, H. C. "Lang. Lab. Lesson", J. Ed. Sociol, 35, (1962), pp. 273-4.

RANDAL , EARLE S., "The Lang. Lab.: A New Tool", The Educational Forum, (1956),

RANDALL, EARLE S., "The Use of Television in Teaching Fles", The DFL Bulletin, 4, (1965), pp. 1-2.

RANDALL, EARLE S., and SCHMIDT, S. EDGAR, "Polyglot Workshop: Lang. Teachers re-tool for A-V", MLJ, 38, (1954), pp. 85-6.

REED, JANET S., "Students Speak about Audio Learning", Educational Screen, (1958), p.178.

REED, P. C. "Break through the Audio Barrier", Educational Screen, 37, (1958), p.561.

REGENSTREIF, HARRY, "Why Stop at Lang. Labs?", Audio-Visual Instruction, 7, (1962), pp. 282-3.

REGENSTREFF, HARRY, "Why Stop at LLs?", Radio,Television and Hobbies, (1964), pp. 7, 45.

REID, RICHARD J., "An Exploratory Survey of Foreign Language Teaching by Television in the United States", Reports of Surveys and Studies in the Teaching of Modern Foreign Languages, (1961), pp. 197-211.

REINDORP, R. C. "Role of the Laboratory in the Foreign Language Program", Hispania, 45, (1962), pp. 829-36.

RIVERS, WILGA M., "Tape Recorders and Language Laboratories", The Secondary Teacher, (1965), pp. 23-39.

RIVERS, WILGA MARIE, "What can $74,000 Buy?", Babel, 25 (1964), pp. 22-23.

ROBERTS, GRAVES B., "An Introductory Course in Spanish Pronunciation for Undergraduates", *MLJ*, 35, (1951), pp. 297-302.

ROBERTS, JOHN D., "Starting a Small Language Laboratory", *Hispania*, 39. (1956), pp. 503-504.

ROE-MERRILL, S. HEFFNER, "The Lang. Lab.: What to Buy", *Monatshefte*, (1960), pp. 331-341.

ROERTGEN, WILLIAM F., "Experiment in Pronunciation", *Educational Screen and Audio-visual Guide*, 38, (1959), pp. 588-91.

ROERTGEN, WILLIAM F., "The Functional Language Laboratory", *MLJ*, 43, (1959), pp. 6-10.

ROERTGEN, WILLIAM F., "Functional Lang. Lab.", *MLJ*, 43, (1959), pp. 6-10.

ROERTGEN, WILLIAM F., "Planning for the Germanic Languages Lab. at UCLA", *Modern Language Forum*, (1957), pp. 25-37.

ROERTGEN, WILLIAM F., "Textbooks in German and the Language Laboratory", *SDLL*, *IJAL*, 29, (1963),

ROSENTHAL, L. P. "Foreign Languages with Emphasis on Audio-Visual Techniques", *Grade Teach*., 78, (1961), pp. 57-8+.

ROSSELOT, LA VELLE, "Audio-Visual Techniques in Foreign Language Teaching", *MLJ*, 33, (1949), pp. 544-550.

RUARK, HENRY C., Jr., "Technology and Education", *The Phi Delta Kappan*, (1961), pp. 387-392.

RUST, ZELL, O., "The Language Laboratory in Southern California", *Modern Language Forum*, 39, (1954), pp. 25-39.

SABBETH, MORRIS, "Some Aspects of Teacher Training in Lab. Techniques", *J.Ed.Sociol*, 35, (1962), pp.271-2.

SACKS, NORMAN P., "Structural Drill, Current Spanish Textbooks, and the Language Laboratory", *IJAL*, 29, (1963).

SALEMBRIER, H. L. G. "Case for the Lang. Lab.", *French Review*, 33, (1960), pp. 371-8.

SAVAGE, H., "Language Laboratories", *Ontario Journal of Educational Research*, 4, (1962), pp. 155.

SCHERER, GEORGE, A. C., "Oral Work with the Wire Recorder", *MLJ*, (1947), pp. 261-263.

SCHERER, GEORGE A., and WETHEIMER, MICHAEL, "The German Teaching Experiment at the University of Colorado", *German Quarterly*, 35, (1962), pp. 298-308.

SCHERTZ, P., "Aue faire d'un Laboratoire de Langues?", *Le Francais dans le Monde*, 31, (1965), pp. 13-17.

SCHUELER, H., "Audio-lingual aids to Language Training: Uses and Limitations", *Quarterly Journal of Speech*, 47, (1961), pp. 288-92.

SCOTT, STAN. and JUST, FRANK, "An Open Letter to Modern Language Methodists", Babel, (1963), pp. 34.

SCULTHORP. MABEL A. L. "The Lang. Lab.", LOWE, MARGARET & JOHN (eds)., On Teaching FLs to Adults, (1965), pp. 22-35.

ROSSELOT, LA VELLE, "Audio-aids Techniques in FL Teaching", MLJ, 33, (1949), pp. 544-550.

SCHULTHORP, M., "Language Lab. Progress", Visual Education, (1963), pp. 6-8.

SHANE, MILTON L. and HELEN LUCY, "Labs. for FL Teaching", Educational Leadership, 18 (1961), pp. 293-8.

SHEPPARD, D. C. "So what is Audio-Lingual?", Hispania, 44, (1961), pp. 292-5.

SHERBURN, M. L. "Music in the Lang. Lab.", Mus.Educators J., 50, (1964), pp. 109-10.

SICILIANO, ERNEST A., "Forensics in the Lang. Lab.", MLJ, (1961), pp.305-306.

SILIAKUS, H. J. "The Effectiveness of the Lang. Lab. - Two Reports", Babel, 26, (1964), pp. 19-26.

SILIAKUS, H. J. "A Note on the Effective Use of the Lang.Lab.", NS, 1, (1965), pp. 33.

SILVA J., "Lang. Lab. Performance", Ed. Screen Av. G., 41, (1962), pp.600, Same Ed. Digest, 28, (1962), pp. 42-3.

SMITH, PHILIP D., "Do I Need a Lang. Lab.?", MLJ, (1961), p. 320.

SMITH, PHILIP D., Jr., "Lang. Labs. for the Layman", Dept. of Education, Reno, Nevada, (1961), pp. 31.

SMITH, R. LORNE, "Some Consideration that Seem to Weigh Against the Use of Tape Recordings in the Lang.Lab.", MLJ, (1960), pp. 75-76.

SMITH, R. LORNE, "Tape Recording in the Lang.Lab.", MLJ, 43, (1959), p. 228.

SPOHN, CHARLES, L. "Music Instruction in the Lang.Lab.", Theory into Practice, 1, (1962), pp. 25-9.

STACK, EDWARD M., "Laboratories - The Effectiveness Controversy", MLJ, 48, (1964), pp. 189-194.

STACK, EDWARD M. "The Lang. Lab. and Modern Language Teaching", OUP, NY, (1960), pp. 149. (third printing 1962).

STEVICK, EARL W. "Structural Drills in the Laboratory", in Gravit and Valdman (eds.), Structural Drills in the Lang. Lab, IJAL, 29, (1963), pp. 37-44.

STIEFEL, WALTER E., "Bricks Without Straw , The Language Laboratories", MLJ, 36, (1952), pp. 68-73.

STREVENS, PETER, "Aural Aids in Lang. Teaching", Longmans, Lond., (1958), pp.44.

STRICKLAND, R., "Language Laboratories: Emphasis on Languages: A Unique Success", Il Va. J. Ed., 53, (1964), pp.11-12.

SWITZER, REBECCA, "A-V Aids in Teaching Modern Foreign Languages", Hispania, 31, (1948), pp. 68-69.

TANZMAN, J. "Language Labs", The Instructor, 71, (1962), pp. 37-9.

TELSCHOW, LLOYD, W. "Wabasso's Lang.Lab.", Minnesota Journal of Education, 42, (1962), p.14.

THOMASON, CATHERINE DENNIS, "Junior High Learning Lab.", National Education Association Journal, 52, (1963), pp.15-16.

THOMSON, F. PAUL., "Language Laboratories", The Listener, (1963).

THOMSON, F. PAUL, "A Research Report: Teaching in a Technological Age", Design, (1965), pp. 37-47.

TOUS, ALFONSO, "Initiating a Lang. Lab.", American School Board Journal, 145, (1962), p.17.

TOUS, ALFONSO, "Nature and Philosophy of the Lang. Lab. Method", National Catholic Educational Asscn., Bulletin 58, (1961), pp. 269-73.

TOUS, ALFONSO, "We Need Two Lang. Labs.", Catholic School Journal, 61, (1961), pp. 25-8.

TRAKAS, P. N. "Lang. Lab. Questionnaire", MLJ, 42, (1958), pp. viii-xi.

TRAVIS, DAVID E. Dr., "Suggestions for Equipping a Lang. Lab.", Kansas State Teachers College, Emporia Service Bureau for Mod. Lang. Teachers.

TRENHOLME, A. K. "How Portland is building a Lang. Lab.", American School Board Journal, 139, (1959), pp. 27-28.

TRUMP, J. LLOYD, "The Educational Setting for the LL", Najam Edward W. (ed.), Materials and Techniques in the LL, Rep. 2nd LL Conference 23-25/3/1960, IJAL, 28 (1962), pp. 124-130.

TURNER, D., "Planning the High School Lang. Lab.", French Review, 32, (1958), pp. 160-5.

TURNER, J. D. "Lang. Labs.: An Investment for the Future", Times Ed. Sup., (1962), pp.2477-595, Discussion (1962), 2478-646, 2479-678.

TURNER, J., "Teaching Machines and Lang. Labs", Teacher Education, 2 (1961), pp. 25-36.

TURNER, RAYMOND, "Occupation : Languages Lab. Director", MLJ, 48, (1964), pp. 151-154.

TURNET, DAYMUND, "Deux ex Machina", *MLJ*, (1948), pp. 396-398.

TUSIANI, JOSEPH, "Machine: Master or Servant?", *Journal of Educational Sociology*, 34, (1961), pp. 248-51.

VALDMAN, ALBERT, "Breaking the Lockstep", *SDLL*, (1963), pp. 147-160.

VALDMAN, ALBERT, "How do we Break the Lockstep?", *Audiovisual Instruction*, 7, (1962), pp. 630-634.

VAUGHAN, CLARK, A., "The Case for the Electronic Classroom", *Independent School Bulletin*, (1961).

VOGT, HARTMUT, "Das Magnettongerat im Fremdsprachenunterricht, im Berliner Arbeitsblatter fur die Voklshoheschule, 8, (1959).

VOGT, HARMUT, "Das Tonband im Fremdsprachenunterricht Berlin, Verlag Volk und Wissen, 1957 mit ausfurrlichem Literaturverzeichnis.

VOGT, HARTMUT, "Tonband und Tonfilmschleife im Fremd Sprachemunterricht", (x) See Books, *International A-V Technical Centre*, Col 63/WD 5/13, 13 pages.

WALKER, WARRENS, "LL at Blackburn Coll.", *Quarterly J. of Speech*, 44, (1958), pp. 111-2.

WALSH, DONALD, "A Clearer Look at the New Look", *MLJ*, (1960), pp.168-170.

WALSH, DONALD, "Whom does the New Look Threaten?", *MLJ*, (1960, pp.270-271.

WATKINS, JAMES M., "The Library System and the Lang.Lab.", *The French Review*, 34, (1960), pp.60-66.

WATSON, N., "Glenbrook High School, Northbrook III, Projects on Internship, Large Classes, Team Teaching, Teacher Aides, & Lang.Lab.", *National Asscn. of Secondary School Principals' Bulletin*, 261, (1961), pp. 50-56.

WATTS, G. B. "Dedication of the Davidson Coll. Lang. Lab.", *French Review*, 31, (1958), pp. 562-3.

WATTS, V., "Learning Lang. in the Lab.", *Pennsylvania School Journal*, 108, (1960), pp. 330-1.

WESTERVEEN, G., "Electro Acoustics in the Service of Lang. Study", *Philips*, (1961).

WESTON JOHN, "The Tape Recorder in the Classroom", *National Committee for Visual Aids in Education*, (1960).

WHITE, LAWRENCE B., "Analysis of Problems of Maintenance and Operation of Lang. Lab. in California High Schools", *California Schools*, 32, (1961), pp. 437-455.

WHITEHOUSE, ROBERT, S., "The Work-Shop: A Language Laboratory", *Hispania*, 28, (1945), pp. 88-90.

WHITEHOUSE, ROBERT S., "The Work-shop Method in German", MLJ, 39, (1955), pp. 174-176.

WHITEHOUSE, ROBERT S., "The Workshop Program: Demonstrating the value of the Lang. Lab.", MLJ, (1945), pp. 590-595.

WILLIAMS, N. L. "The Teaching of Languages by Sound", International A-V Technical Centre, Col. 63/ WD 6/4, 4 pages.

WILLIS, ROBERT M., "Language Lab. at New York University", J.Ed.Sociol., 33, (1960), pp.221-5.

WILLIS, ROBERT M., "Testing and Evaluation of Progress in the Lang.Lab.", J. Ed. Sociol., 33, (1962), 276-7.

WILSON, BYRON, A. "Modern Approach to Mod. Lang. via. the Lang.Lab.", Ohio Schools, 38 (1960), pp. 16-17+.

WINFIELD, LOUISE G., "New Materials for a New Day", Najam Edward W., Materials and Techniques for the LL, Rep. 2nd LL Conference 23-25/3/1961, IJAL, 28 (1962), pp. 55-61.

WISEMAN, ROBERT, "Do-it-youself Lang.Lab.", Educational Screen, 39, (1960), pp. 586-9.

WITT, P. W. F. "New Ferment in Av.", Teach.Col. Rec., 64, (1963), pp. 340-3.

WOJNOWSKI, MARGARET, "Emphasis on understanding and Speaking: The Foreign Language Lab.", and JOHNSTON, MARJORIE C., "Modern Foreign Languages in the High School", Ed. & Welfare Bulletin, 16, (1958), pp. 65-72.

WOJNOWSKI, MARGARET V., "Foreign Languages Labs. in a High School", MLJ, 41, (1957), pp. 251-252.

WOJNOWSKI, MARGARET V., "A High School Lab. Classroom", Educational Screen, 37, (1958), pp. 183.

WOOD, EDNA and HENWOOD, VIRGINIA, "French in the Lab. School of the University of Missouri", FR, 14, (1941), pp. 214-219.

WOODRUFF, MELBA, "Lab. Use for FL Learning", Ohio Schools, 39, (1961), p.10.

WRIGHT, N. P. "Audio-Visual Work with a Lang. Lab.", Modern Languages, 45, (1964), pp. 104-111.

YAKOBSON, HELEN B., "Russian by Television - Evaluation, Problems and Prospects", The Bulletin of The National Asscn. of Secondary School Principals, 44, (1960), pp. 99-110.

YOUNG, CLARENCE W. and CHOQUETTE, CHARLES A., "An Experimental Study of the Relative Effectiveness of four Systems of lang. Lab. equipment in Teaching French Pronunciation", Colgate University, (1963), p.110.

YOUNG, BILOINE, "A Do-it yourself Lang.Lab.", MLJ, 43, (1959), pp.221.

ZAGEL, MILTON, "Teaching the Teacher with the Tape Recorder", MLJ, (1954), pp. 194-5.